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ORIGINAL ARTICLES

ON NEW METHODS OF DIAGNOSING DENTOFACIAL DEFORMITIES*

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NOTWITHSTANDING the many technical improvements adopted in the treatment of dentofacial deformities during the last twenty-five years, orthodontists continue to meet with cases that baffle their skill. The frequent, incessant offering of novel methods of treatment certainly warrants the opinion that many preceding modes have failed to accomplish their intended purpose. Reluctantly perhaps, though none the less frankly, we must admit that our immoderate devotion to technic has not attained the satisfaction we anticipated, that many problems remain to vex and irritate us, and that the high hopes of our youth (encouraged by the pretensions of sectarian schools) have not been realized.

The faultless correction of a deformity, like the successful treatment of a disease, presupposes an accurate diagnosis. But the popular methods of diagnosis are based upon a restricted, dental interpretation of oral deformities and hence are inadequate for a precise description of their known structural lesions and functional disturbances. Twenty-five years of clinical observation and practice have convinced the writer that *malocclusion of the teeth* occurs as a primary lesion in only a very limited number of cases, that *malrelation of the dental arches* without involvement of the supporting osseous structures is rare, and that many deviations heretofore classified as distoclusions and mesioclusions actually present *deformity of the jaws*. Many orthodontic texts admit some, or all, of these facts, but they do this quite casually and entirely ignore the gravity of their implications. Thus far, we

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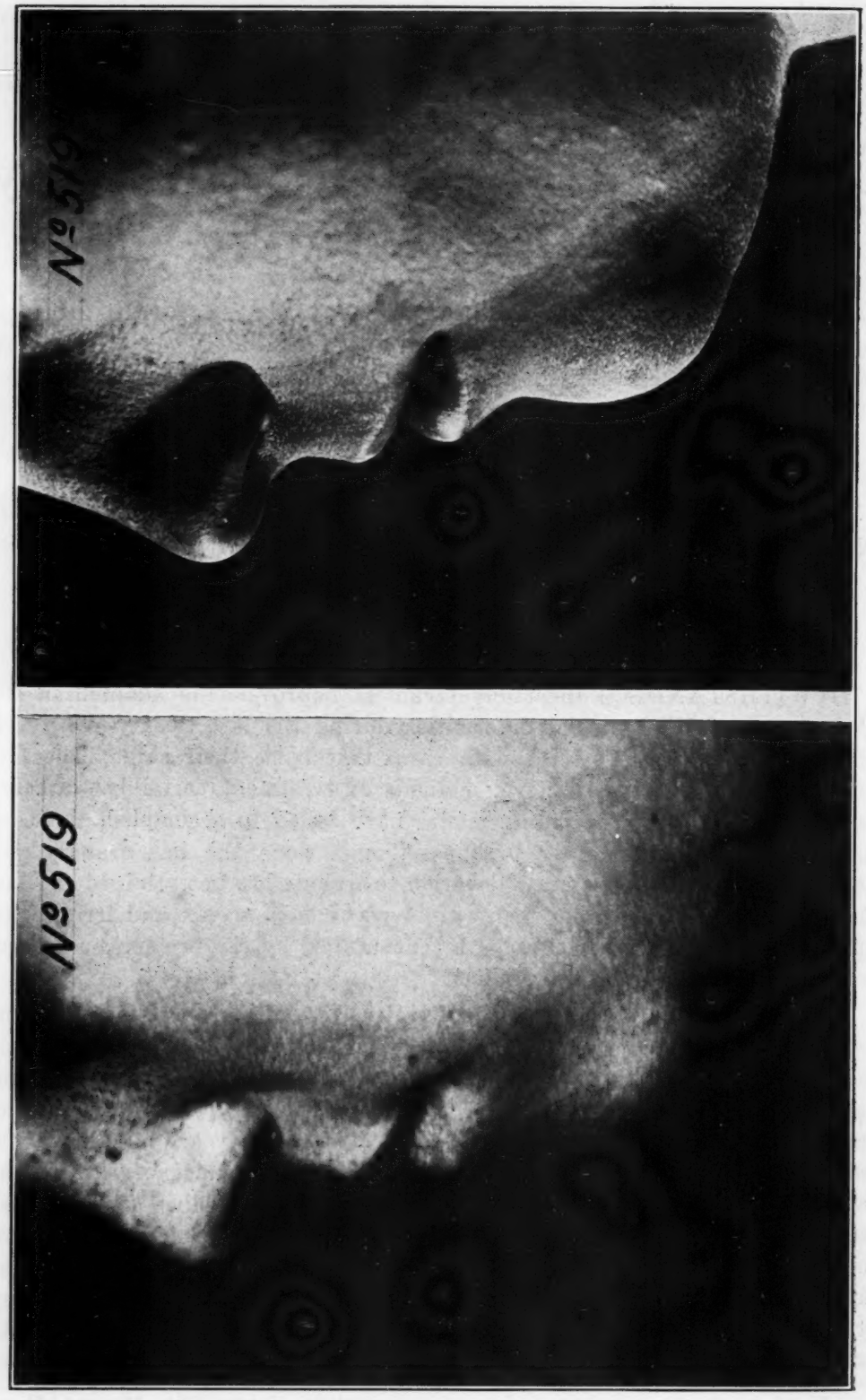


Fig. 1-4.

Fig. 1-*B*.

Fig. 1-*A* and *B*.—Standardized, life-size facial prints, before and after treatment.

have not been able to determine the extent, or incidence, of jaw deformities; but this inability does not render them nonexistent.

The functional and structural modifications of the involved facial features have also been grossly disregarded by intraoral, occlusal enthusiasts. The contentions of the late Dr. C. S. Case were unsupported by definite methods of procedure, and his conclusions were, perhaps, too subjective. But a basic principle of his classification, that of emphasizing dentofacial relations, is tacitly accepted today, even by his antagonists. The methods recently advocated by engineers, for surveying the dental arches, fall into the fatal error of entirely ignoring these fundamental relationships.

The accurate reproduction of dental malocclusions by means of plaster casts is universally accepted as a standardized aid in making a diagnosis; but the symmetrical trimming of casts has been carried to such extremes as to foil their purpose. The most perfect cast ever made is, after all, but a step in differential diagnosis. The relation of the denture to the anatomical landmarks of the face is assuredly as important as the occlusion of the individual teeth.

The rapid development of radiography has enabled us to interpret abnormal and arrested dentition with increased accuracy. And this advance came at a very opportune time, when the widespread tendency toward early treatment of mixed dentures demanded finer definition.

But the diagnostician must learn to form a vivid and exact mental picture of the entire dentofacial area of his patient, so that the true nature of the relationship of the part to the whole may be definitely established. He must comprehend the basic significance of form and function, as well as of structure.

Scientific diagnosis has made great strides in recent years, due to the introduction of exact physical and chemical methods, the invention of numerous instruments of precision, and of electrical appliances. Physiology and biochemistry, bacteriology and pathology have contributed very materially to this advancement in modern medicine and established "its right to be called scientific."

An accurate, critical and comprehensive analysis of all oral deformities, and the scientific development of clinical methods for their early detection, is a pressing need in dental orthopedic practice, and should be generously welcomed. The following suggestions are presented in response to an invitation from your officers and, I am afraid, rather prematurely, because certain work pertaining to the subject is incomplete. The cases of which graphic records have been made are from my private practice. Several hundred of these have been completed, though the number of normal individuals in the series is very insufficient.

STANDARDIZED PHOTOGRAPHS OF THE FACIAL FEATURES

Distortion of the facial lines constitutes a common complication of oral deformities and in my experience has averaged as high as 84 per cent. The correction of these facial abnormalities is frequently a fulfilment of orthodontic treatment and has impelled many orthodontists to keep photographic records of their cases. (Fig. 1.) It has been customary, however, to assign

the making of these photographic records to portrait photographers, whose knowledge of our requirements is usually meager. In all probability, this practice is largely responsible for the widespread indifference that persists toward the significance of functional and structural modifications of the involved facial features.

Appreciating the need and possibilities of scientific records, the writer installed the necessary photographic equipment in his office ten years ago. Numerous methods and appliances have been tried and many discarded during this period. A constant aim of all these efforts was to standardize, as

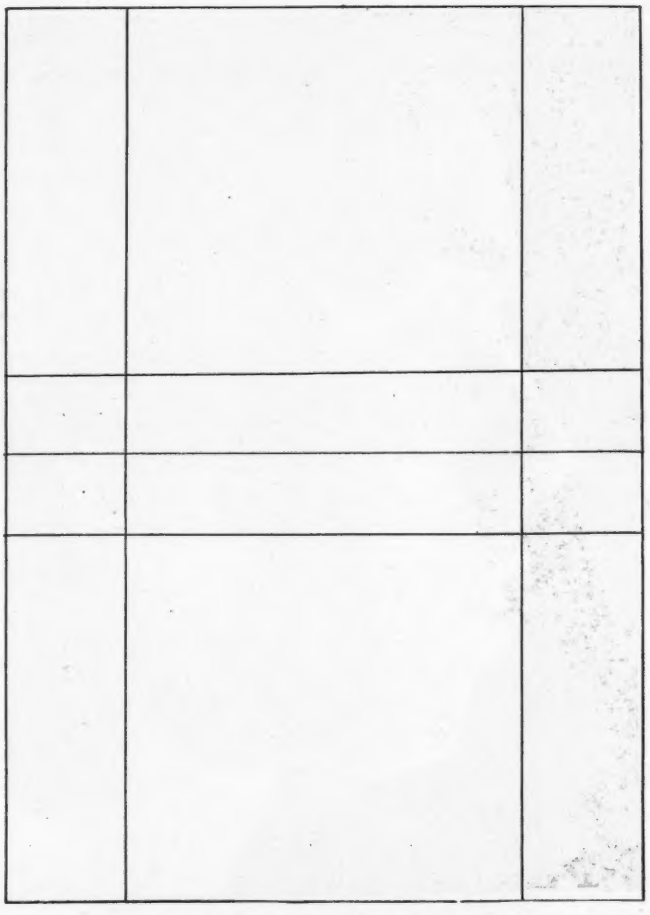


Fig. 2.—Pattern of transparent celluloid 16 x 22 cm., (showing lines) used for placing on negatives before marking outer edges.

nearly as possible, the finished photographs, as well as the materials and methods employed. Enough progress has now been made to justify the recommendation that every orthodontist should use similar methods in his diagnostic work.

A complete description of these methods is reserved for some future occasion and the time at my disposal can thus be utilized in demonstrating the value and desirability of new methods of diagnosis. Briefly, the essential requirements of the photographic technic are as follows: The films employed for this purpose should measure 8 × 10 inches, so that the entire face can be

recorded life-size. (These are subsequently filed with the case-histories.) Before prints are made from a negative it is placed on an illuminated field and a transparent celluloid pattern, measuring 16×22 centimeters, is fixed in position. This pattern bears certain horizontal and perpendicular lines marked in India ink, to facilitate its exact location, after which its margins are scratched on the negative with an edging-pencil. (Fig. 2.) These markings serve as a guide for subsequently placing the matts used in printing. By adopting a method of this kind facial prints will provide accurate data for differential diagnoses and exhibit a necessary uniformity.

Fig. 3.—Profile print; *a-a*, shows horizontal line (subaurale-subnasale); *b-b*, shows Frankfort horizontal (orbitale to tragion).

The horizontal line at first employed on profile plates was that used by portrait artists, which passes through the *subnasale* and *subaurale*. (Fig. 3, *aa*.) But the former is frequently within the involved field of abnormality and thus probably varies considerably. For this reason the suggestion of Professor Simon, that the Frankfort horizontal (*orbitale* to *tragion*) be used, was adopted. (Fig. 3, *bb*.) The perpendicular margin of all profile prints should always form an angle of ninety degrees with this horizontal and it should lie not less than three centimeters from the *subnasale*. The abnormal habits of the lips, their form and structure are accurately recorded in pho-

tographs of this kind. The structural modifications of the symphysian angle and the size and development of the mandible can also be studied in a unique manner.

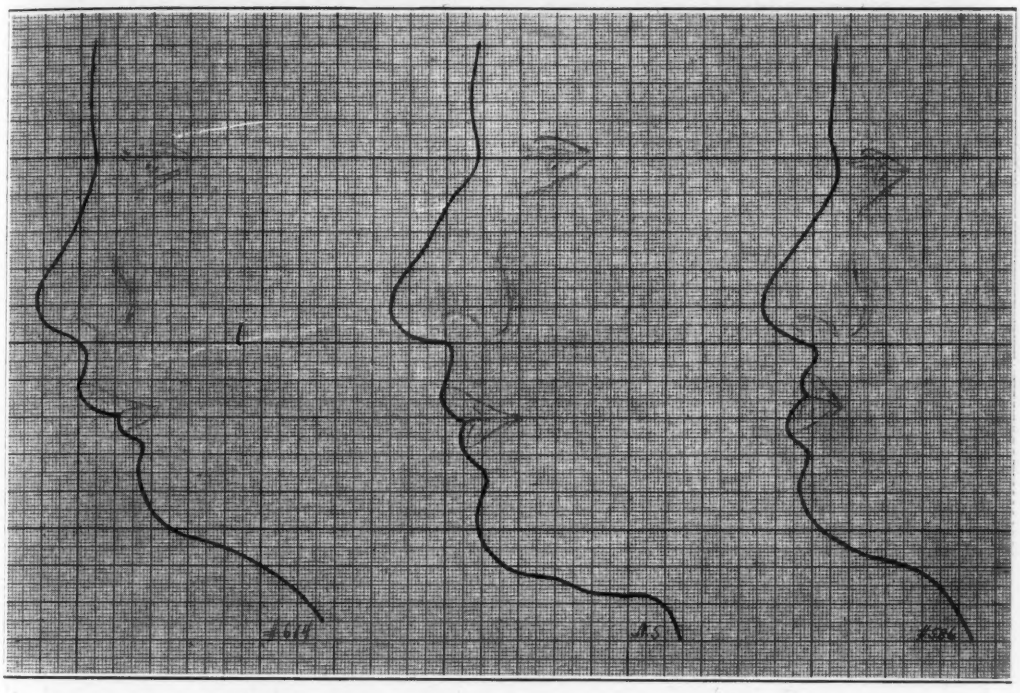


Fig. 4.—Tracing of female profiles on graph paper; Case 614 presented a micromandibular deformity; N. 5 a normal denture; 586 a macromaxillary deformity.

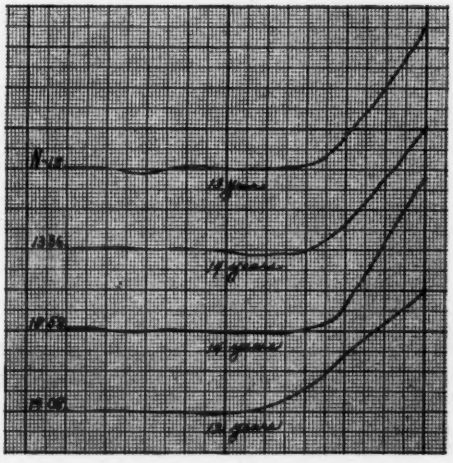


Fig. 5.—Tracing of the left mandibular angles in females; N. 13—normal denture; 1336—neutroclusion; 1858—distoclusion; 1908—mesioclusion.

GRAPHICAL METHODS

Shortly after adopting this standardized technic it occurred to me that additional advantages might be gained if the profile negatives (being life-size) were used for graphical tracings. By placing them on the illuminated field and then covering them with semitransparent paper bearing millimeter

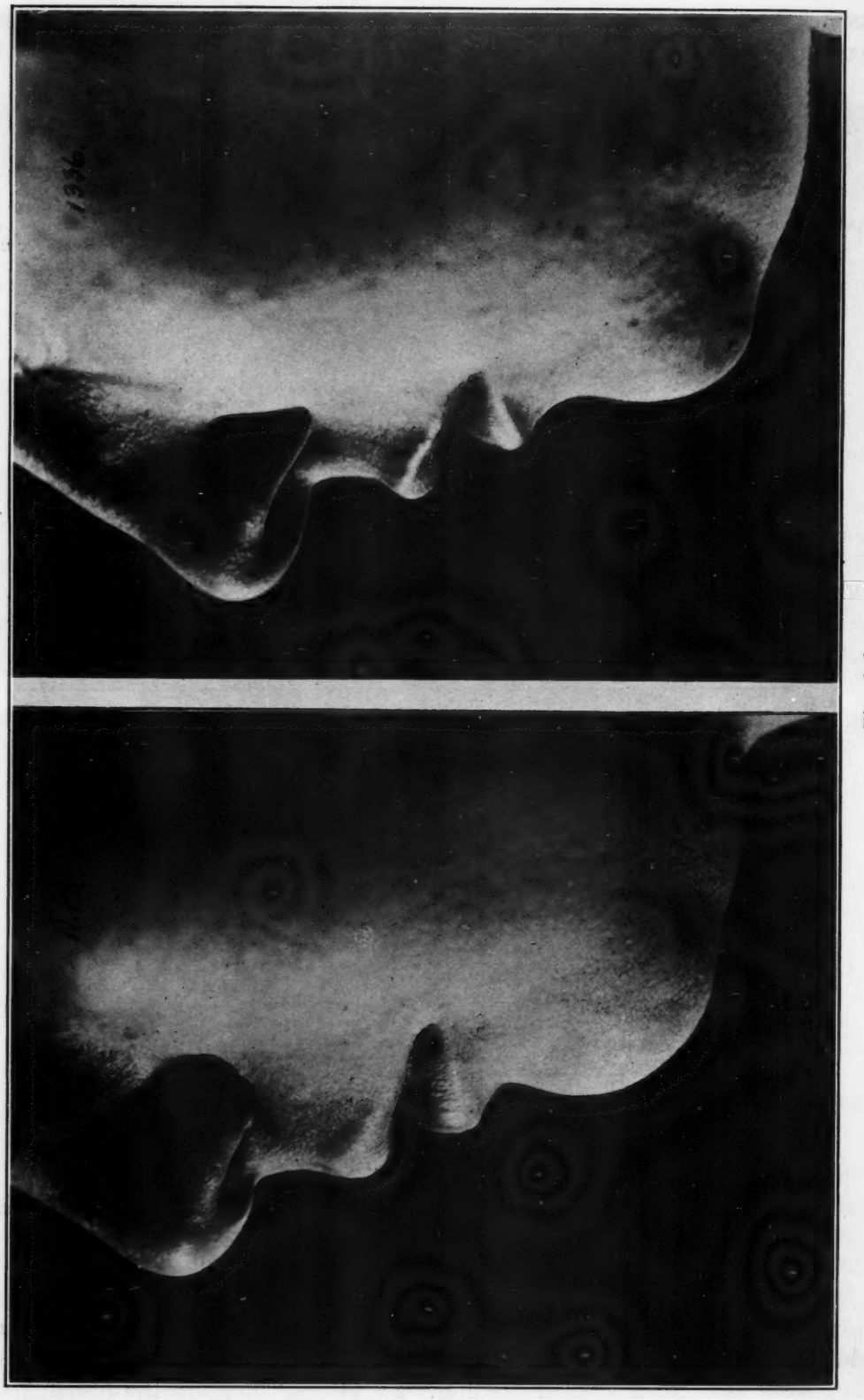


Fig. 6-A.

Fig. 6-*B*.

Fig. 6-*A* and *B*.—Profiles of the patients whose left mandibular angles are traced in Fig. 5.

and centimeter printed lines, a tracing can be obtained which accurately records their one-dimensional aberrations. In this manner it was found that a group of similar malocclusions presented a variety of facial outlines, and a selected group of profiles exhibited considerable diversity in their dental malocclusions. Extreme distortions were also rendered mathematically comprehensible and suggested the feasibility of further study of individual and group characters in conjunction with tracings of normal individuals of the same age and sex. (Fig. 4.)

These tracings proved so alluring that the method was enlarged to include the mandibular angles. A lead wire, sixteen gauge (B. & S.) thick and six inches long, was procured and moulded over the posterior margin of the ascending ramus and down over the lower margin of the mandibular body.

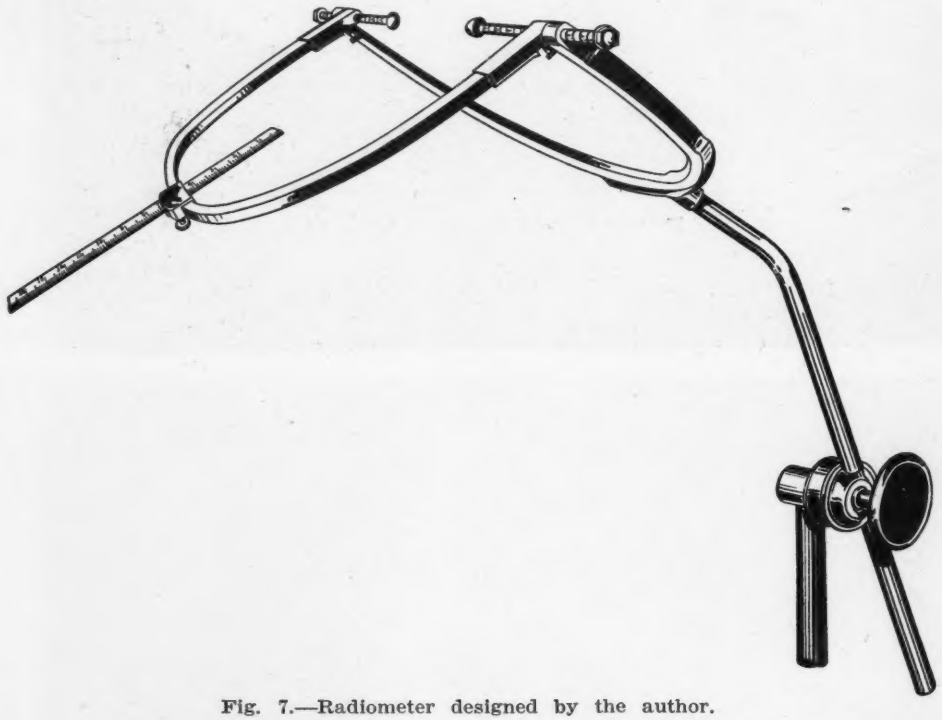


Fig. 7.—Radiometer designed by the author.

The wire must be soft enough to yield under pressure, yet hard enough to retain its form when removed to the tracing paper. Considerable variation in mandibular angles may be noted by this method. Cases presenting infraversion of the anterior teeth (so-called open-bite cases), and mesioclusions, all exhibit marked obtuse mandibular angles. Distoclusions and neutroclusions, on the other hand, usually reveal angles approaching ninety degrees. (Figs. 5 and 6.) The writer does not recall any previous contribution on this subject, nor on the probable changes produced in the mandibular angles by orthodontic treatment. Future investigations may well prove that in extreme deformities, unless the treatment is instituted very early, the routine orthopedic measures are incapable of effecting a complete correction. Probably oral surgery offers the only hope of cure in such cases.

The work of Christian Bruhn (Deutsche Monatsschr. f. Zahnheilk., July,

1921) contains the report of several cases of macromandibular and micromandibular deformities which have been corrected by surgical methods. The diagnosis in each instance seems, however, to have been determined without employing any definite, diagnostic method.

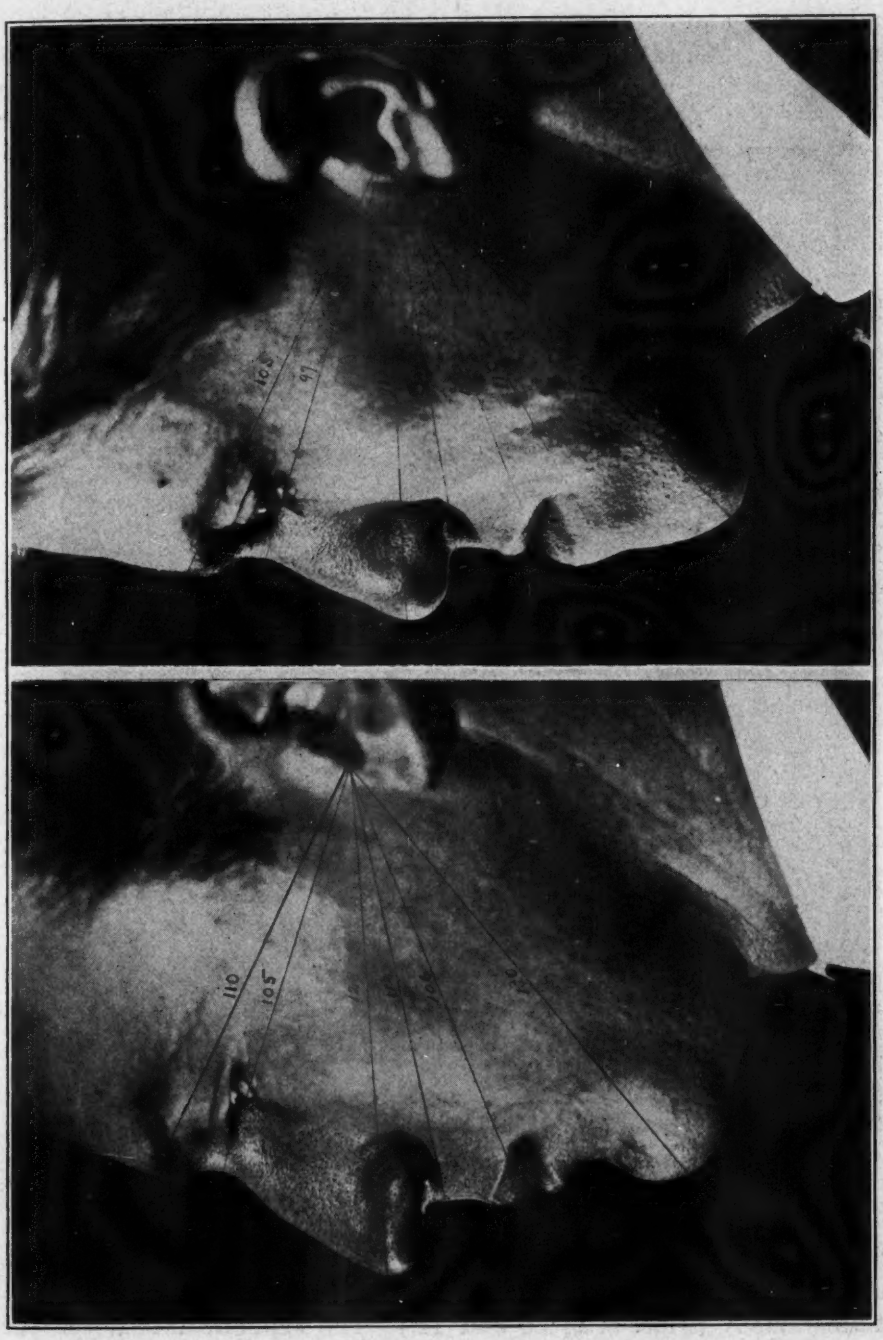


Fig. 8.—Profiles of two males, age 22 and 24 years, on which ear-radii have been drawn showing actual measurements. Figs. 9 and 10 show their dental casts.

FACIAL MEASUREMENTS

Measurements on the teeth, after the manner of Hawley, Bogue, Pont, etc., have contributed very materially to diagnostic procedure. Facial measurements, for the study of variation, have also commanded considerable at-

tention among physical anthropologists. (See Lehrbuch d. Anthropologie, Martin.) Ear-radii recommended by Wallace, Campion and Keith, after the manner originally suggested by Busk and Cunningham, attracted the writer's attention to the subject. His experience with Wallace's prosopometer led to the conclusion that the factor of error should be reduced to the minimum, and the use and application of such an instrument rendered as practicable as possible. A radiometer was accordingly designed for use on orthodontic patients, so that every child applying for treatment might conveniently

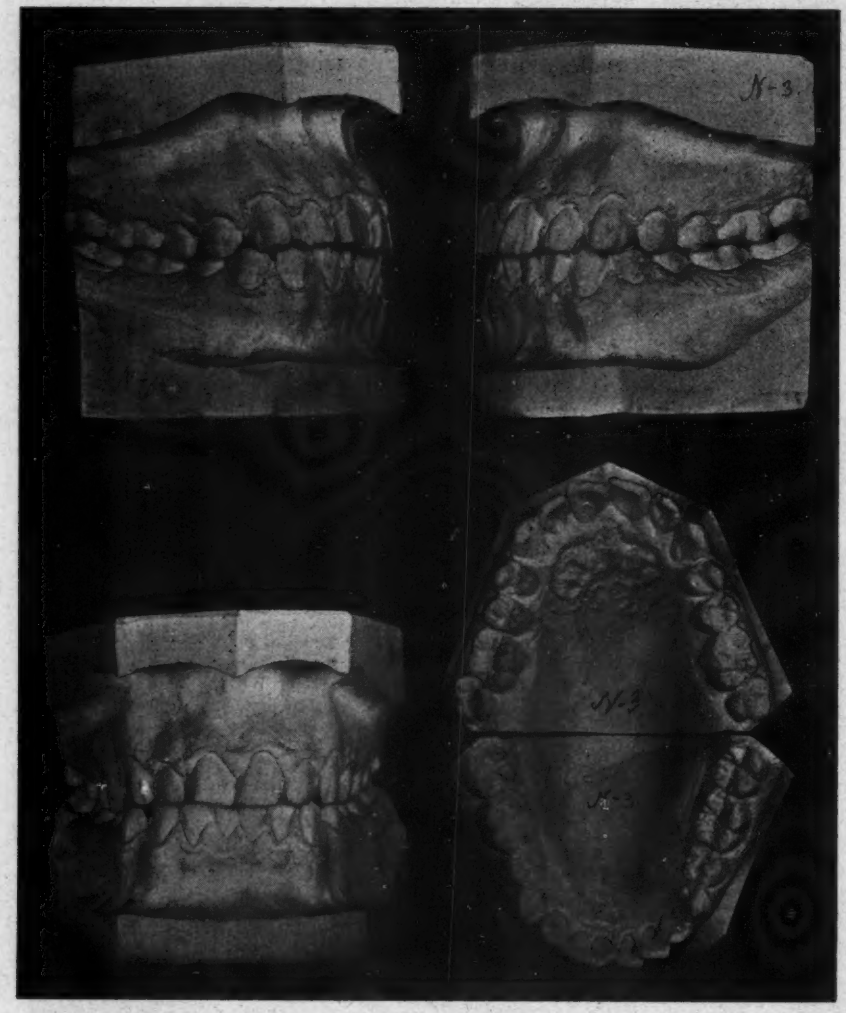


Fig. 9.—Dental cast of normal profile shown in Fig. 8.

be put through a definite routine of facial measurements. (Fig. 7.) A number of individuals with normal dentures have also been recorded but, as previously mentioned, this group is too limited to warrant decisive conclusions at this time. (Figs. 8, 9, 10 and 11.) The cephalic index, the facial length and width, the length and bilabial height of the oral fissure and the bigonial width of the mandible have also been included in these measurements. So many fine facts have been gathered in this manner that it seems reasonable to recommend these methods for general adoption. (Fig. 12.)

In 1536, on his return to Louvain, Vesalius, with Gemma's assistance, secretly procured a human skeleton. "The treasure, however, was not complete; one finger, a patella and a foot were missing. To this extent was Vesalius the owner of a human skeleton. In supplying the missing parts he was obliged to incur new dangers. He stole out of the city in the nighttime, climbed

Fig. 10.—Dental cast of abnormal profile shown in Fig. 8.

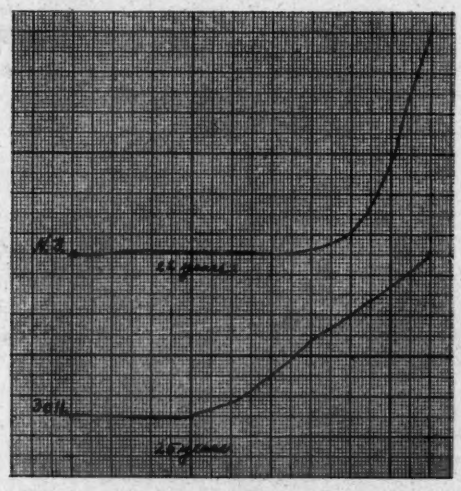


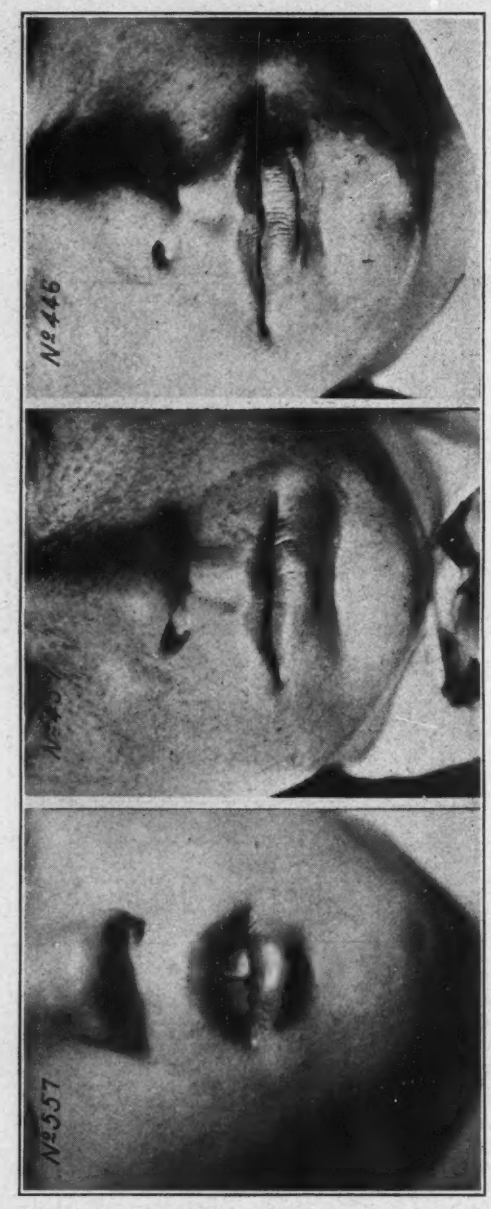
Fig. 11.—Tracings of the left mandibular angles of males in Figs. 8, 9, and 10; N. 3—normal denture; 3011—macromandibular deformity.

gallows unaided, searched through the mass of decaying bodies, and, having found the coveted bones, he stole into the city by another gate." (Ball.)

In 1542, in describing the mandible, he showed that it did not consist of two pieces, as taught by Galen, and accepted for twelve centuries. The "Bryans" were more numerous and powerful in those days than now. Three

hundred and eighty-two years have elapsed since then, but the modifications of the mandible are not yet fully understood, nor will they ever be, if we remain anchored in the haven of occlusion.

When your essayist consented to prepare this paper *On New Methods of Diagnosing Dentofacial Deformities* he planned to include a review of the numerous other methods which have appeared in our literature during recent



ch.-ch.=32m.
ls.-ll.=28m.

ch.-ch.=47m.
ls.-ll.=16m.

ch.-ch.=60m.
ls.-ll=13m.

Fig. 12.—Prints showing variations of oral fissure length, cheilon to cheilon, and of bi-labial height.

years. But the principles and methods employed by Dr. Paul W. Simon, of Berlin, are so fundamental, comprehensive and practical, that when arrangements were completed for his presence at this meeting, it was deemed unnecessary to include this review. As announced in our printed program, he has prepared a paper and clinical demonstration for this afternoon entitled: *"On Gnathostatic Diagnosis in Orthodontics."* He will demonstrate the con-

struction and value of *gnathostatic models* and *photostatic photos,* and their use in determining the exact relations of the human denture to the three planes of the head.

DISCUSSION

Dr. Howard.—It seems strange that we, as a profession, have failed to appreciate the importance of studying the face in conjunction with malocclusion. The reason for this is undoubtedly due to our past teaching, which led us to believe that mechanics were paramount in orthodontic therapy. The same reason is probably responsible for the general belief that most malocclusions are local in origin. This paper stresses a point which is going to lead to a more scientific diagnosis of malocclusion in its relationship to jaw development. It was shown by the essayist, for instance, that distocluding cases presented a well-developed mandible. He also showed distocluding cases with an underdeveloped mandible. The "forces of occlusion," we have too long set upon a pedestal and worshiped as responsible for jaw development.

In Nashville, before the Southern Society, LeRoy Johnson showed a case that had fourteen or sixteen congenitally missing teeth. This case showed well-developed jaws. In Waco, Texas, where I was guest of the Southwestern Orthodontic Society, I had the opportunity of reporting several cases, which simulated those shown us by Dr. Lischer. The cases presented were viewed not only from the oral standpoint, but were carefully observed from general aspects, with the assistance of medical men. We are but a part of medicine and when we confine our observations to the face, we are either lacking in initiative or dull of comprehension.

Dr. Lischer has shown methods here which as far as I am concerned have more value than anything presented in recent years.

Dr. Ketcham.—Dr. Lischer has gone a step beyond us, one which we must follow in order to make a better diagnosis. I think that many of us have been remiss in not photographing, as he mentioned, our patients ourselves. We have either gone without photographs, or we have let a photographer make them without our supervision. If you will pardon a personal remark, since 1902 when Dr. Angle first impressed upon my mind the need for accurate photographic records of our patients' features, it has been my practice to make four photographs of each and every patient at beginning of treatment, taking the right and left profile, the full face in repose, and another smiling showing the teeth, always with the patient at a given distance from the camera lens.

Dr. Lischer spoke of making a full face analysis of the patient on an eight by ten plate. That is excellent. I have not done that. I have simply used six and one-half by eight and one-half plates with two exposures, one for each half of the plate, so that really my individual exposures are half of the six and one-half by eight and one-half plate. Dr. Lischer's method is better.

Another point. He did not go into the technic of making the photographs and I should not mention it, but I know some, in photographing their patients, use the lens of too short focal length, for instance, eight inches, and it is just as though you closed one eye, approached close to a person and looked at the person's face with the other eye. You would have a distorted vision of the malar bones in comparison with the ear or with the rest of the features. Indeed, in my opinion, no shorter than a twelve inch focal length lens should be used.

Now, you say, "It is a great deal of trouble to photograph all the patients and do it myself." If you systematize your technic, you will find that it only takes a few minutes and is comparatively easy. Then you may say, "My lighting is poor." By consulting with your photograph supply dealers you will find that artificial lighting can be secured which is excellent.

Another point. It is only through comparison of a large number of cases that you can gain a conception of the variability in the profile which may be—well, I was going to say normal, or which may pass as normal.

Professor E. H. Wuerpel, as some of you know, is a wonderful lecturer on art. He

is really the most entertaining and instructive lecturer that I have ever listened to along these lines. Years ago in listening to him, the point was driven home that there is no rule, no law which we can lay down for the normal facial outline, or the beautiful, for the reason that there are so many different types of subjects. Another reason is no two people have the same conception of beauty. Therefore, the human equation enters and it is a matter of judgment. But these measurements aid our judgment so that it will be more accurate, our diagnosis more nearly correct, and we can be of greater benefit to our patients if we use all of these aids.

Now, referring back again to the trouble of photographing all these patients. You may say, "What is the use? This child's face, he is only five or six, looks about normal. Why do I bother photographing him?" For the purpose of making a comparative study with later photographs, also with other patients. Another reason is that you may find some finicky, fussy mother some day, as I have, saying, "Why, Johnny's eyelid is drooping. I wonder if it was due to your orthodontic treatment." By referring to the photographs taken a year or so previously, it is a great deal of satisfaction to show her that our treatment hasn't caused this trouble.

I heartily thank Dr. Lischer for bringing this before us.

Dr. Suggett.—I feel rather timid in discussing a paper by this great man, the latches of whose shoes I am not worthy to unloose. I wanted to speak of just one phase of his subject, education. Perhaps education might include pretty nearly all of his paper. Education, as I understand it, is sort of trying to get rid of the guessing, the superstition and the bunk, which is a little hard to do. It is so hard that it is seldom done. Sometimes it is easier to change conditions themselves than to change our way of thinking of them. We go along thinking in the same old way, afraid of a new idea. We are timid and move slowly, no matter how much our impatient leaders try to hurry us. So, understanding this, we should not get impatient with our slow progress in orthodontic education. We must remember that our profession is very young. It has only been since 1888 or '89 that we have seen a little in the journals about the idea of expansion of arches. That was the beginning of the new school of orthodontia.

Orthodontic education has gone through only two or three phases. In the first phase, the professor of orthodontics spent a few hours a week showing a few cases to the students. He used old German silver appliances in the crudest way, cutting his own threads, drawing his wire, making his tubing and making his own nuts. The more complicated the malocclusion, the more complicated was the appliance. If you look in some of the old textbooks, the pictures of appliances look like the zodiac man in the almanac, for there was a jack-screw pointing at each individual tooth.

In the next phase, the students carried on the cases, and it is just lately that we have had to admit that this did not work. In the third phase, the handling of all cases has been taken over by the staff. All base metal appliances were done away with and only precious metals used. Students were allowed to observe but not to handle cases. The short term schools sprang up. They did a service but they were found to be inadequate. No one would dare say that the short term school was the final thing in orthodontic education. A more thorough training is needed. A broader and more fundamental preparation is imperative. Only with these, will it be possible to develop orthodontists who will be able to cope with the problems of the future. The university is the only institution which can undertake this preparation and training. It cannot be done in the undergraduate years. The universities must get ready to give graduate instruction. Several have already announced that they are about to do so. The University of California offers a year's graduate course leading to the master's degree, beginning August 25, 1924. We are only feeling our way and we are experimenting. Perhaps by next year we will scrap half we are doing, but we are making a start and we are trying to get those fundamentals over to the young men as they start off with a broad education so they won't have to spend twenty years as Dr. Lischer and others have spent to get these things, a great many of which they should have started off with right from college. This will make the next generation many steps ahead of us. In making these advances we have to wipe off a lot

of the old superstitions and a lot of the old bunk and a lot of the old denominational teaching.

Just in this connection I might read a word or two from my presidential address before the Pacific Coast Society on denominational education. We were trying to get away from that and step on to something new and I was just reminded of it. I said, "Orthodontic education in the past has been too personal. The orthodontists have the painless Parker system backed off the boards. It has one system. We have two or three.

"One of those systems is the true system and when you are baptized in that faith, your apostolic creed forbids you to touch, taste or handle any appliance except those appliances blessed and sanctified by the anointed one. 'These appliances,' says the anointed one, 'are holy and perfect. You cannot improve them. Do not try.'

"'For twice three hundred and sixty-five days,' says the so anointed one, 'shall you refrain from fashioning any other appliances than those blessed by me. Nor shall you consort with the heathen and the infidel, for I am a jealous god.'"

I quoted from Ki Lung which is a Chinese interpretation of the Arabian Nights in a manner. Upon one occasion he said this which is very apropos: "When he had finished speaking all the more reputable of those present extolled his judgment but some whispered together. Whereupon the anointed one opened his mouth more fully and shot forth tongues of consuming fire among the murmurers, so that they fled howling from his presence."

Dr. Hawley.—This subject is a little hard to discuss at this stage because I know Dr. Lischer has only given us a little glimpse of the work he is doing. I have been interested in it for some little time, and knowing that there is a great deal more to come, I hesitate, even if I were able, to go into any minute discussion of it.

There are some sidelights on this that are very interesting. I think practically all of our men who have practiced orthodontia for some years have really come to a realization that Dr. Case was fundamentally right when he claimed that the retention of a full denture did not always produce the best results in the face, but his work was insufficient and his records and data were insufficient to prove it, and in such form that they did not seem to appeal to the men who were working along that line. Another thing, it had been pretty thoroughly impressed in our minds that the occlusion was everything. But it seems to me it is indicated very clearly that through Dr. Lischer's and Dr. Simon's work we are going to get into a more comprehensive and more accurate study and data on that subject. I think we certainly should recognize the credit that is due to Dr. Case for persisting through all these years that he was right. I believe myself that he is, through more accurate, more comprehensive data, going to be proved right, better than he ever proved it himself.

In regard to this question of photography. It would take undoubtedly a whole session in itself to discuss it in all its bearings. When you get into the matter of photography you are getting into quite an intricate subject, and I have often remarked that I don't think there was any procedure in which a man could neglect so many little details that would spoil his work as he can in photography. I have taken my own photographs for many years, and I am almost ashamed to look at them now, in view of some later work that I have been doing. The taking of photographs, if properly done, means a great deal more than we have thought it did in the past.

They should be so taken, that they are an aid, and an extremely valuable aid, in diagnosis. It takes very little time and it must be done, I think, by the operator himself. It takes very little time after your apparatus is properly selected and properly standardized. I have noticed in my own office that the taking of these photographs takes me a little more than five minutes to make the exposures. I use artificial light, and we always should use artificial light because it is always the same. In daylight you can never tell, in spite of all these exposure meters that are devised, just what your exposure is going to be, but with artificial light, your light is always the same. You sit the patient in the same place, and then you get something of value, something that you can really study and depend upon for a diagnosis.

The lens and the camera and the light should be carefully selected. Dr. Ketcham has spoken of a lens with a long focus. I think he should go farther than a twelve-inch focus. It should be not less than nineteen or nineteen and one-half in order to get perspective. You must have that for the study of type and expression and so on. Even these full life-sized photographs do not give you everything. When you get a short focus lens and get it too close to the face, you have no perspective. You must have a longer focus lens, and get the same thing you see with your eye. Then you can make measurements from that and get a better judgment of the whole field.

I feel that this work of Dr. Lischer's is one of the most valuable that has been brought before our Society for many years. It is going to lead to a more profound study than anything that has been introduced for some time and will be of the greatest benefit. I think Dr. Lischer's name will go down in our literature as one of the founders of a great step in advance.

Dr. Federspiel.—I appreciate what Dr. Lischer said. In addition to taking photographs, which are of value in connection with our history charts, it is important that we have plaster casts made of faces. This with the aid of x-rays, plaster models, measurements and photographs will help us to work out a better diagnosis, and bring us to a better judgment in orthodontics.

Dr. Paul Simon, Berlin, Germany.—I enjoyed Dr. Lischer's paper very much because my own investigations are along similar lines. Dr. Lischer sent me his instrument, the radiometer, about one year ago and I used it for measurements in very many cases.

Dr. Lischer's assertion that the distance between the nasion and the tragion is normally not so long as the distance between the tragion and the gnathion has interested me very much because my own investigations have been the same way. I made many researches by patients and by photographs and I found that this assertion of Dr. Lischer's is absolutely true and correct. So we have another practical and useful and convenient diagnostic aid. I hope you will use this method of Dr. Lischer's in your practice, and I am sure that you will enjoy it very much.

Dr. Lloyd Lourie, Chicago, Ill.—Since refusing your request I have felt an explanation was due. I determined that for one meeting I wouldn't have anything to say, one reason being that I find it so difficult to say what I would like to say, and I feel when I get the stenographic reports of what I have said that it is rather discouraging to feel I came so far short of saying what I wanted to say.

However, I don't want to let the opportunity pass of complimenting Dr. Lischer and saying I always enjoy and profit from listening to his presentation.

Another thing I thought I would like to emphasize, was brought out by Dr. Lischer incidentally and mentioned by Dr. Howard, is that we must recognize our limitations. This method of Dr. Lischer's gives us a more accurate way of determining where the great difficulty lies, and I want to point out it should be used not only to enable us to determine what we would like to do but to enable us to recognize our limitations and the things we cannot do orthodontically. This seems particularly important to me on account of having received recently a reprint of an article by my friend and our fellow member, Dr. Lundstrom, of Stockholm, on the subject, "Malocclusion of the Teeth Regarded as a Problem in Connection with the Apical Base." By apical base he means the long structure underlying the alveolar process. He analyzes the recorded development of orthodontia, changing views and practices, and he has felt that most of us who have been in practice for any considerable number of years have met with a variety of cases in which it was impossible, in spite of previous hopes, to develop bone enough to accommodate the denture in its normal position and to retain it there. Now while this has not been definitely admitted, he assumes it from analyzing the written papers and discussion and I think he has been correct.

He divides malocclusion cases into two great divisions, those in which the applicable base is so deficient that we cannot hope to get ideal results and those in which the applicable base is normal or so nearly normal that we can hope to get our results by ap-

pliances or the usual orthodontic means. That is the important thing that I wanted to bring out, that we must recognize our limitations. It is just as important that we recognize our limitations as it is that we have our high ideals.

This method of Dr. Lischer's is going to be a very valuable one in helping us to determine some of those things.

Dr. Miloslavich.—The paper of Dr. Lischer is not only important and interesting to you as orthodontists but it is very valuable for us as anthropologists.

In his paper he has shown how the facial deformities can be corrected, thereby changing the morphologic aspect of the face; also why the knowledge of pathologic conditions of the facial cranium is of such great importance for the anthropologist and for his work of classification. Dr. Lischer demonstrated so clearly how interesting is the anthropology to orthodontia. He is introducing a new science, a new line of scientific study in your field, and I am positive that he arrived at these wonderful conclusions because his second specialty is anthropology; he proved it today. He proved further the necessity of this science in discussing the form and shape of the human skull.

For the coming generations of orthodontists and oral surgeons it is of imperative necessity that the dental schools introduce obligatory courses in the study of comparative craniology particularly facial anthropology.

Dr. F. A. Delabarre, Boston, Mass.—This paper is of intense interest to me because I have been thinking along these same lines for some time, however without accomplishing anything like what Dr. Lischer has accomplished.

I do not take his presentation this morning to be a complete exhibition of his entire method of procedure. Am I right?

Dr. Lischer.—You are right.

Dr. Delabarre.—It would seem to me in the first place, since this is a part of craniometry, trying to develop the particular field in which we are interested, that his system of measurements should include some of the basic measurements that the anthropologist makes so that when he reviews our measurements he may know, for instance, what type of skull our measurements belong to, that he may tie our work up with his and that we may benefit by the general observations of the anthropologist as well.

Incidentally, as a minute suggestion, in showing the radial lines you gave us the length index; it might be of advantage as well to show the angle which those lines have to a definite line like the plane of Frankfort in order to give perhaps the proportion of growth in the vertical direction above or below that line. That is simply a very minute suggestion.

Lischer alone cannot do all of this work. He said we need an immense amount of data in order that when we get these observations on paper before us in our own offices we may have a mass of data to which we may refer to interpret our own work to make it practical to us. Now, I for one would be very glad to collaborate with Dr. Lischer at the Forsyth Infirmary and gather together what data I may there according to his system.

Dr. W. J. Brady, Kansas City, Mo.—I hope I may have a moment to pay my respects to Dr. Lischer for this wonderful paper he has given us, and to say to him that I have studied along this same line myself, and have arrived at about the same conclusions that he has. Now, I don't think that my particular work has been so wonderfully important, only it may be some satisfaction to Dr. Lischer to know somebody else has studied this same matter and that other findings coincide with his; therefore, he must be right. In fact he is "righter" than the "rightest" rabbit that ever galloped over the plains of Kansas.

I happened to be present at the meeting in which Dr. Angle first gave to the profession of dentistry his conception that normal occlusion was the basis of all successful orthodontia, and it was a most wonderful advance, an epoch in the science. But it is not the beginning and the middle and the end of orthodontia as we first thought, and as we believed without investigation for these many years. The diagnosis of orthodontia by means of

methods such as Dr. Lischer has shown has grown to be far more important than the matter of occlusion. Therefore this marks as great an epoch as Angle's presentation.

Now that we have looked backward a few years to realize how far we have advanced, I want to look ahead into the future a ways. There is still more to this subject than Dr. Lischer has brought out, and still more to this than any of us have been studying, and that is facial art in connection with diagnosis. And if I live long enough and my right hand does not forget its cunning, I am going to have something to bring you on that line to supplement the work of Dr. Lischer.

Dr. Wirt.—Mr. Chairman, I certainly can't add anything to this but I want to ask a question. I want to know whether there was some definite relation between the different measurements that he gave us there as regards the different racial or other types of people. For instance, we have people who are racially of a certain shaped face and build and other faces or types of people of other face or build, would those measurements he gave us have in each case some definite relation to each other?

I also want to find out whether he thinks in the making of these photographs it is really essential to have them as large as he said, or could we use the same proportions or a definite distance, for instance, and a smaller picture, say six by eight? Would that work out?

Dr. Lischer.—I am very thankful for the many kind words that you have spoken here this morning, the more so since, as I said in my paper, it was merely intended as an introduction. What I wanted to show was that something could be done along these lines and to prepare the way for future work; to encourage you to take up this work. I was very careful in saying that I didn't have sufficient data to come to any definite conclusions.

What we want to do is establish norms for various types, and then judge those individuals who come to us by these norms. We must develop additional diagnostic aids; we need them. Think of all the various methods of diagnosis that have been presented in the practice of internal medicine, for instance. Take any one of the important diseases of the alimentary canal, or circulatory system, or nervous system, and think of the many little aids that have been developed from time to time to help in making a diagnosis.

I don't want to say anything disparaging about occlusion. I appreciate that conception as much as any of you, but occlusion is not "the rising or the setting of a sun, the beginning or the end of a day, the folding together forever of wings or the beginning of pinions to soar." Neither are these methods final. I don't want you to get that idea; but we have to develop new methods of making a diagnosis. This afternoon we shall have additional, and what I believe to be better, methods.

I appreciate very much what Dr. Miloslavich said about this being of value to anthropologists. I know he is an authority on that subject.

I have not forgotten the very important preliminary work that Dr. Delabarre did a number of years ago in photography. I very intentionally didn't enter into the technic of photography because it would take us all day to discuss it.

I might add that Dr. Hawley was right in answering Dr. Ketcham; we need a long focus lense. I use a nineteen inch focus to get these pictures.

In reply to Dr. Wirt, I might say that it is not necessary to take these pictures life-size, as Dr. Simon will show this afternoon; but whatever size you take be sure you know definitely.

In conclusion, I would like to demonstrate the use of the radiometer. I will ask Dr. Suggett to act as patient and be seated in this chair.

The size of this bow is based upon the tables of head measurements in Martin's text book on anthropology and hence is large enough to receive the head of any patient that may apply for treatment. It measures 20 × 30 centimeters and the anterior half is detachable.

The head-rest of the dental chair is removed, or lowered sufficiently, so that the radiometer may be applied from the rear. The fibre-tipped rods, after being cleansed with alcohol, are inserted in the external auditory meatus on each side. These rods are marked with a scale, so that they may be inserted equally, and they are pushed into the ears as

far as possible. After this they are fastened with the small set screws. The anterior bow is then placed into position and the 15 centimeter scale is inserted in reverse manner. This renders the reading easier.

Measurements are now made to the glabella, the nasion, the pronasion, the subnasion, the incisal edges of the maxillary central incisors, and the pogonion of the chin with the teeth in occlusion. These measurements are recorded on the record and can also be drawn on the photographs as radii.

PRESIDENT'S ADDRESS BEFORE THE PACIFIC COAST SOCIETY OF ORTHODONTISTS

By A. H. Suggett, D.D.S., San Francisco, Calif.

MEMBERS of the Pacific Coast Society of Orthodontists, I am very happy to greet you here today. We can congratulate ourselves that we have lost none of our members, and that it is possible for so many of us to be present for another pleasant and profitable meeting.

We are more than delighted that we have on our program such a large number of college professors who will speak to us on academic subjects. I think I can truthfully say that they will present to us the most fundamental program that our Society has had the opportunity of enjoying. We are deeply indebted to these scholars for their valuable contributions to our program. We enjoy meeting them and knowing them better. They are bringing new thoughts and new solutions to our problems in physiology, psychology, pediatrics, paleontology, heredity and nutrition. We sit humbly at their feet as eager listeners.

Another year has come and gone since last we met. We have grown older and, I hope, wiser and more tolerant.

Stop! look! and listen! is as good advice for an orthodontist as it is for an automobilist. If we look and listen, we will learn that our bands, wires, teeth and the patient's whole physical condition would like to say some very important things to us. Perhaps the bands might say: "It is impossible for me to hold on to this tooth. It is not my size. I keep slipping." The wires might say: "I can't lie comfortably. I am in too much of a strain." The tooth might say: "I am about to fall backward or sideways, and there is a big cavity under my collar." The physical condition might say: "I am about all in. My gums are inflamed. I can't chew my food. A wire is poking my tongue and another is gouging my cheek. I have some gumboils and rotten tonsils. I have paid my whole fee, and still I cannot get my upper lip over my centrals. I am getting no better very fast."

Therefore, if we have stopped, looked, and listened with an open mind, we shall be able to bring to this meeting many new truths and experiences, that will enlighten others and make the meeting pleasant and profitable.

We present this program in all humility, realizing that we really know very little, and wondering whether it will sound as wise to us five years hence

as it does today. Each one should frankly relate the progress he has made, and the failures he has met, so that others may profit by these experiences. Why should it be necessary for each one to repeat experiences that have proved failures, or to taste all the poisons? Let us study history and learn what those who have gone before have discovered, and then proceed from where they have stopped. We should not be afraid of a new idea. We should keep an open mind for new truths, new methods, new arguments and new theories. We should remember that the practice of today was the theory of yesterday.

We are practicing a scientific profession in a scientific way. In discussing a scientific subject, we should use scientific terms. We should have a scientific terminology. Such a one has been adopted by the American Society of Orthodontists after four years of discussion. The editors of our magazines agreed to it and are using it. The old terminology is not scientific and is not understood by other scientists. The Latin terminology is. I urge that the profession keep step in this important advance. It is disappointing that such an able and brilliant orthodontist as my friend Pullen should use the old terminology in his latest contribution on orthodontics in Johnson's Text Book of Operative Dentistry.

There seems to be an impression abroad in the dental profession that Orthodontists restrict their services to certain types of malocclusion, and that they set certain age limits for patients. From this attitude on the part of a few orthodontists there has developed a belief that it is not possible to correct cases past a certain age, that adults cannot be treated successfully, and that mutilated cases cannot be even partially corrected. I am not questioning the right or propriety of any orthodontist to confine his efforts to certain types of malocclusion, but I am calling your attention to an attitude that is abroad in the profession, that it is not worth while to bother with patients over sixteen, eighteen or twenty years of age, or to assist the prosthodontists with mutilated cases when the patient is twenty-five or thirty years of age.

Suppose the dentists should refuse to repair doubtful teeth; or decline to place a filling in teeth in linguoversion; or refuse to insert a denture for a mesial case because it would not look well, or would not be an ideal case. The dentists do not question the propriety of offering their skill wherever they can increase the comfort and efficiency or improve the appearance of the patient. Is there any reason why the orthodontist should not be as ready as the dentist is, to minister to the comfort of patients?

The question of graduate work in orthodontics is being pressed on us for an early solution. A few years ago the profession was almost unanimously opposed to the universities undertaking this service. I dare say that this attitude at the present time is absolutely reversed. The short courses that were so popular in the past are now recognized to be woefully inadequate. The profession is now turning to the universities to supply this service and several of them are working very earnestly on the problem.

Dr. A. LeRoy Johnson has announced that they were ready to give graduate work this school year at Ann Arbor. Being a full-time professor, Dr. Johnson will be able to lead the way in orthodontic education. He is a

broadminded, liberal and well-educated natural teacher. The University of California has worked out the undergraduate course very satisfactorily. Next year we will be ready to take the graduate students for a year's work in orthodontics.

GRADUATE INSTRUCTION IN ORTHODONTIA

The problem of graduate instruction under consideration by this society during the past two years is definitely resolving itself into a plan of action in the University of California.

The Dean of the Graduate Division of the University has advised the Dean of the Dental School that there are apparently no obstacles in the way of establishing graduate courses leading to the degree of Master of Science on completion of the present four years' requirement for the D.D.S. degree. Positive statements to the effect that these courses will be established in the fall of 1924 cannot be made at this time, for the matter is to be considered this afternoon at Berkeley by the Graduate Council and if it meets with their favorable approval, it will, if necessary, be referred to the Academic Senate, the governing body in matters of educational legislation, on March 3.

If the Senate approves of the recommendations made by the College of Dentistry and concurred in or amended by the Graduate Council, these courses will be established in the session of 1924-1925 and will be open to all candidates in August, 1924.

A brief specification of the proposed graduate course outlined in the form in which it is printed in the announcement of courses is as follows:

Orthodontia

The Staff (Suggett in charge.)

204a. Clinical Orthodontia
Lectures on advanced theory of orthodontics, etiology, biologic aspects, diversified methods of treatment.
Lectures: Tu 8. Clinic: Tu 9-12. 4 units.

The Staff (Suggett in charge.)

204b. Advanced Orthodontic Technic.
Lectures on special designs, applied physics, materials.
Lectures: F 8. Laboratory: F 9-12. First semester. 2 units.

The Staff (Suggett in charge.)

204c. Orthodontic Practice.
Lectures on the conduct of an orthodontic practice, histories and accounts.
Lectures: F 8. Second semester. 1 unit.
Thesis. 4 units.

Suggested topics:—
Changes in the osseous structure and peridental membrane under orthodontic treatment.
Etiology of certain cases of malocclusion (bearing perhaps on an individual case being handled in the clinic.)
Habits in relation to malocclusion.

The remainder of the units necessary to complete the requirements for the M.S. degree may be selected from one of three groups, the humanities, the physical sciences and the biologic sciences.

It would be desirable for the candidates for this degree to select correlated subjects with such an end in view.

Individuals who propose to engage in teaching orthodontia would profit by a selection of courses in

Education: 101, 110, 111, 112, 115, 116, 120, 180.
English: 112a and b, 106k.
Philosophy: 109, 114, 120a and b, 104a and b, 121 a and b.
Psychology: 124, 133, 166a and b, 167, 168, 112.

Persons contemplating orthodontic practice would profit by pursuing studies in

Chemistry: 110.
Physics: 111a.
Anatomy: 102, 108, 109.
Anthropology: 103.
Bacteriology: 101.
Hygiene: 101, 107.
Physiology: 101.
Zoology: 105, 114, 115.

In addition advanced courses can be arranged for in dentistry in the Department of Prosthetic Dentistry including restorations; in biochemistry, with special relation to diet and nutrition during the pre-natal, infantile and adolescent periods and perhaps special courses in their analogy.

Aside from this general plan providing advanced instruction in orthodontics with a definite prescription of a given number of units of work in the major subject and an additional number of units in minor subjects with a thesis, one other opportunity presents itself for complying with the requirements for the master's degree in the University, and that is a selected piece of research.

Under this plan any candidate possessing the D.D.S. degree or the B.S. degree with certain preparation during this period of time may undertake a piece of research under the guidance of a committee. The accomplishment in this piece of research including the report or thesis and such other material as may be a part of it, will be recognized as the equivalent of the Master requirement, if in the judgment of the committee in charge it is worthy of it. Thus, the opportunity is open for men now engaged in the field of orthodontia to become candidates for the Master's degree by presenting a complete statement of qualifications and undertaking a piece of research subject to the approval of the committee in charge.

DISCUSSION

Dr. Leland E. Carter, San Francisco.—While I deeply appreciate the honor of opening the discussion of our president's address, I am fully conscious of my inability to offer a discussion that the wit and wisdom of our essayist's remarks merit.

Dr. Suggett's paper is replete with facts and information born of long experience and careful observation, and sparkles with relishable humor.

At this critical period in the evolution of orthodontics, "stop, look and listen" is, indeed, good advice. We must take counsel of our "hindsight" if we would that our "foresight" become more keen. We must extract from our daily experience all possible

knowledge and continuously strive to so improve ourselves in every phase of our work that we may keep pace with our ever-increasing responsibilities.

Our program for this meeting indicates the broadening scope of orthodontics and one needs but to glance at the titles of the various papers to fully realize that much midnight oil must be burned in order to keep up with the rapid advance of our specialty.

Dr. Suggett's reference to the variations in our terminology is most opportune and deserves serious consideration. The people of Babylon were scattered to the four corners of the earth by a confusion of tongues. Let us take warning, then, from the story of "The Tower of Babel" and bend our every effort to root out this confusion of terms and ideas.

That we are being accused of selecting our cases, is something new to me. As a matter of fact, I was under the impression that orthodontists were being charged with instituting interference where it was not needed, instead of selecting cases. The question of when to treat is a serious problem and there seems to be a considerable diversity of opinion on the subject. Perhaps this difference of opinion has given rise to the impression that we select our cases. If such an impression has gotten abroad in the dental profession, it should be corrected.

In the matter of orthodontic education, we are confronted with a very different problem. This question is programmed for discussion at this meeting of our society and I am sure that a great deal of valuable information will be brought out so I will not deal at length with the subject. Dr. Suggett has outlined a proposed graduate course to be given at the Dental Department of the University of California. This course is designed with the idea of more adequately preparing graduate dentists for orthodontic practice than the short courses now in vogue. Whether it will answer the requirements remains to be seen. We may feel sure that it is founded upon sound educational principles by men with years of pedagogical experience. Drs. Millberry and Suggett are prepared to launch their orthodontic educational ship upon an uncharted sea so that a course to meet the ever advancing requirements of orthodontic practice may be worked out. We are indeed fortunate in receiving the hearty cooperation of men who are willing to give their time and bend their efforts toward a solution of our educational problem.

Dr. Suggett has focused our minds on some very important things, and is to be congratulated for having delivered such a snappy and interesting address.

Dr. J. Camp Dean, Oakland, Calif.—When I first visited the Pacific Coast Society of Orthodontists I was amazed at the reports of failures I heard. It was common talk. I knew I was causing a lot of grief for some of my patients, but I was not telling about it. I was always resolving to do better on the next case. Dr. Suggett was one of the principal reporters of failures then and he has been since that time. Now, as our president he is encouraging us to report the things we have not been able to do well, so that others could profit by our experience.

Why does Mr. Molar tip "backward and sideways" when stress is applied in some cases and not in others? I have a theory that it is the physical condition before the work is started. Fat babies are not always healthy babies. Neither are rosy looking children always strong vitally. Give me a child who runs and plays after school, gets up a vigorous circulation and perspires freely, and I can undertake his work with utmost confidence. The teeth will respond to the slightest impulse and act in a perfectly normal way. But if a child has two music lessons a week after school with the practice necessary, and a dancing class another afternoon, etc., and never has time for invigorating play which is the natural, normal thing, there may be trouble in the response to orthodontic treatment. The difference in time of treatment will be as one to three.

The simplicity of the appliance and the psychologic time of treatment are very important factors in orthodontia. The knowledge of when to step in and with the least possible interference with normal development is of great value. We should inspire dentists to consult us and anticipate some of the conditions we are called upon to treat in older children. It is not that they cannot be successfully treated up to adult life, or that mutilated cases cannot be improved. But it is so much simpler to steer the erupting teeth

to their normal positions during the formative period. I could care for a larger number of cases and serve humanity better by limiting my patients to those under twelve years of age. When a mandibular six year molar has been extracted I admit I lose interest in the case.

I most heartily agree with Dr. Suggett when he states that, "Our great problem is to make it possible for every child, rich or poor, high or low, to have an equal chance for a healthy mouth."

Although not mentioned by the president I cannot refrain from praising a subject I know to be very near to his heart and of general interest to all. I refer to the section meetings of our Society. The association of the men in near-by localities more frequently than the annual meeting is bringing about a better understanding of many of our problems. It adds an interest to the Society and our work which to me has been most gratifying.

Dr. James D. McCoy, Los Angeles.—There are many points in our president's address which we perhaps could discuss with profit, but I shall say only a few words on that portion dealing with orthodontic instruction for the graduate. It seems to me the plan he has outlined is logical, and personally I shall watch with a great deal of interest the carrying out of the work, especially during the first year. Regardless of who attempts this task, it is hardly possible to initiate it without some imperfections; but when carried out under the auspices of the university, where the science of teaching is developed, it seems to me the various courses entering into orthodontic instruction will have a better opportunity of being thoroughly correlated than under any other auspices. We are all of the opinion that any such course should embrace three channels of teaching, the lecture course, the laboratory course and the clinical course.

Whether or not, as Dr. Suggett has specified the various hours given to these different subjects will prove correct, only time will tell. He or Dr. Millberry, or anyone else trying to solve this problem, will have to work it out as the years go by.

The question as to what material we should give the postgraduate is a thing I have never felt I could judge definitely. I think one of the best ways we can arrive at a solution of that problem would be to look at the men whom we most respect as orthodontists and see what their characteristics are,—what they possess that make them what they are. We could name a dozen men who are outstanding figures in orthodontia, successful in everything that the term success implies. So if we try to analyze these men we can perhaps go part of the way in determining what should be given to future orthodontists, and we can also help to arrive at a solution of this problem by analyzing our own shortcomings. We know that in our work we feel handicapped, and if we honestly ask ourselves, "Where do my greatest handicaps lie?" and try to avoid them in the future, orthodontists, we can accomplish a great deal. At any rate the University here has had the courage and the foresight to attempt this thing at this time, and is to be commended.

Dr. B. Frank Gray, San Francisco.—Dr. Suggett has made reference to the possibility of orthodontic help for adult patients. I know, of course, it is advocated in many quarters that the treatment of malocclusion of the teeth shall be confined strictly to children. In that connection I remember the suggestion made by Dr. Arthur Black in setting forth the idealistic conception of preventive dentistry, i.e., that if the profession henceforth was to give its undivided attention to the dental problems of children, including all phases of preventive work, we might well afford, economically considered, to allow the adult to go without dental care,—that in time this procedure might work the most good for humanity. Of course, Dr. Black does not expect this method of meeting the great problems of dentistry, will prevail. Neither do I believe that orthodontists can justly ignore the needs of the adult patient who seeks relief from malocclusion and its accompanying deformities.

It has been my practice to give attention to numbers of patients, quite beyond the period of childhood, in fact, mature individuals. It is with increased satisfaction at re-

sults attained that I make this statement. With methods now available for retaining the teeth, I see no reason to justify the exclusion of these individuals from our practice. Certain forms of removable retaining devices may be worn over indefinite periods of time. They may be worn at night, and in fact their use two or three nights each week may be sufficient to maintain the teeth in splendid arrangement,—certainly much to the delight of the patient.

Dr. Suggett.—I wish to thank the members for their discussion of my address. As Dr. Carter has said, our venture in graduate work is the commencement of a voyage on an uncharted sea, and we only expect to start off with as much data as we can collect which will be calculated to form a practical basis for our work. We shall have the feeling that we be ready to scrap or change anything that does not work out satisfactorily in practice.

DEPARTMENT OF
ORAL SURGERY AND SURGICAL ORTHODONTIA

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FUNDAMENTAL PRINCIPLES AND RECENT CONCLUSIONS IN SURGERY OF CONGENITAL CLEFT PALATE*

By Truman W. Brophy, M.D., D.D.S., F.A.C.S., Chicago, Ill.

WHILE attending the Pennsylvania College of Dental Surgery of Philadelphia I also had the privilege of attending the surgical clinics of Dr. James E. Garretson, the father of oral surgery and the foremost man of his time in this special field of work. It was my further opportunity and pleasure to attend regularly the clinics of Dr. S. D. Gross, the father of American surgery, of Dr. Joseph Pancoast, one of the foremost surgeons of his time, of Dr. J. Ewing Mears and of Dr. D. Hayes Agnew, whose name was broadcast throughout the world by reason of his services to our martyred president, James A. Garfield.

After graduation fifty-one years ago I concluded that, inasmuch as I had never before been so far east as the boundary between Illinois and Indiana, I would visit the surgical clinics of Washington, Baltimore, New York and Boston, presuming that I would never again have an opportunity to travel so far east.

In New York I visited the clinics of various surgeons of renown, among whom was the leading orthopedic surgeon of the day, Dr. Louis Sayre. I presume many of you know that he was congenitally lame. Probably through his misfortune he was led into surgery, and orthopedics especially appealed to him.

It was in Dr. Sayre's clinic that I was prompted to undertake a kind of work which he declared was impossible. To this clinic, which was large, patients came who suffered from all sorts of deformities, congenital and acquired. On my first visit, there was among them a tall, thin, poorly clad woman, bearing all the evidences of extreme poverty. In coming, she had faced a snow and rain storm, so common in the last days of March. Her

*Read by invitation before Minneapolis Surgical Society, December 6, 1923.
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face wore an anxious, troubled look. She had brought her little child, two weeks old, to the great surgeon with the hope that it might be cured.

Its deformity was one of the most conspicuous and distressing that ever saddens a home. It consisted in protruding premaxillae, double cleft lip and complete cleft of the palate, the vomer not being attached to either side.

The surgeon took the child in his hands and explained to the class the nature of the deformity. He said in substance, "Gentlemen: This child's deformity is so extensive, the tissues are so abnormally placed, that it is not amenable to successful treatment—the treatment that would bring all the parts into normal relation. You will observe that the premaxillary bones are more prominent than the nose: the prolabium is far removed from the lateral portions of the lip. We have one course open to us and that is to excise the bones, after which the clefts in the lip may be closed." He held the child up before the class and said, "I grasp with my hand the sides of the child's face and find that I am able to move the bones toward each other. If we had some way by which these bones might be approximated, the premaxillary bones brought into correct relation with the maxillae and if we could, after placing them in contact, immobilize them and bring about a union, we could go far toward correcting the deformity. But such an operation has never been performed. We have no means of doing it."

The doctor handed the little child back to its weeping mother, who stood holding it fondly in her arms, still looking at him while he informed the class that some months later he would excise the premaxillae and sew up the lip and when the child was nearly grown an artificial palate could be provided as an aid to speech.

The incident was tragic. The expression of the mother's face I can never forget. She turned away with a saddened heart, to wander through the beating storm with a feeling that there was scarcely any hope for her unfortunate child. A deep impression was made upon the class. Not a sound was heard among the students while the child's condition was being described by the surgeon. Everyone, it seemed to me, was in deep sympathy with the mother. Such was the experience of this mother—and even today oftentimes little hope of help is offered to the mother, who is always the greatest sufferer.

I repeat Professor Sayre's statement: "I grasp the sides of the child's face with my hand and find that I can move the maxillary bones toward each other. If we had some way by which these bones might be approximated, the premaxillary bones brought into correct contact with the maxillae and if we could, after placing the bones in contact, immobilize them and bring about a union, we could go far toward correcting the most conspicuous deformity known to mankind. But such an operation has never been performed. We have no way of doing it." The pale-faced, disappointed mother is still before me; the stentorian voice of the late premier American orthopedic surgeon still rings in my ears as he said: "Such an operation has never been performed. We have no way of doing it."

It was then I was obsessed with a desire which has been never-failing but increasing to devise a way that would enable me to bring about a union

of the separated misplaced bones in such deformities. More than the average human lifetime has been devoted to devising and improving a method which will give as a result a hard palate of normal breadth, a long, flexible, well-formed soft palate and an arch or framework upon which to construct a full, well-shaped lip and normal nose. Upon my return home in the spring of 1872, I began to work conducting experiments upon the bones of young animals. Professor Garretson had told us that because of the fact that the bone was not sufficiently ossified to fracture he could take the tibia of a kitten and tie it in a knot. It is estimated that at birth, bone is about one-half organic matter and therefore capable of bending or moving when pressure is made upon it. So I believed that the maxillary bones in a young cleft palate patient might be bent and moved into proximity.

I found that at that time in New York City and quite generally through the country, many of the leading surgeons had abandoned palato-plastic surgery on the ground that their operations were generally failures. Garretson has said: "As generally practiced, it is rather difficult of performance and so frequently unsuccessful that the surgeons seem disposed to avoid the responsibility of it." Nonunion occurred in a large majority of their operations and failure of function nearly always followed. Had they understood the proper age at which to perform these operations, the order of procedure of the different steps and especially the correct technic of the bone surgery essential to this work, they would have operated on these patients in infancy with good results.

From 1860 to 1880 and later, the great prosthetist, Norman W. Kingsley of New York, with numerous assistants, was occupied with construction of artificial vela for cleft palate patients, many of whom had undergone unsuccessful operations.

In the light of surgical advancement and the development of modern methods of procedure, the old time theory that infants could not endure palate operations and that they should be made only on children from seven to ten years of age or thereabouts, has become a thing of the past. We now know that every advantage is gained by early operation which allows the proper order of procedure; less shock and reaction, greater ease of manipulation and results in correct function. To delay operating until after habits of speech have been developed, which are frequently so defective that the individual cannot be understood, is oftentimes an irreparable mistake.

All surgery of the palate should have for its goal perfect function, that is, perfect speech. The test of success is the quality of enunciation resulting. Two phases of palatal surgery have especially to do with this: first, the union of the separated bones of the palate including the management of the premaxillae and second, the control of the tuberosities in their relation to the soft palate. These two fundamentals I wish to emphasize, for without a proper conception and execution of these in palatal surgery there is small hope of securing satisfactory results either in form or function.

I wish to present to you briefly the course which I am convinced leads to the nearest approach to normal form and function in the palate. This course provides for operation in early infancy, it contemplates the establish-

ment of a *normal palatal arch* and the *prevention* of the *spreading* of the *tuberosities,* it calls for *three stages* in the treatment of typical double cleft of the lip and palate and *sometimes four,* if complicated by protruding premaxillae. These stages are as follows. (1) the freshening, approximation and immobilization of the cleft bones so that union may take place; (2) the closure of the lip; (3) the closure of the soft palate; (4) elevating the nose, which may have become flattened by moving the premaxillae backward.

1. This step should be done as soon after birth as is expedient. I have found the fourth to tenth weeks most satisfactory, as in an otherwise normal child all functions of the body have become fairly well established by that time.

2. The closing of the lip should be done in from six to ten weeks after the bones have been approximated.

3. The closing of the soft palate should be deferred until just before speech is attempted, that is, not earlier than the eighteenth month.

4. The nose should, if necessary, be elevated later.

While agreement is fairly general now as to the wisdom of the early operation, uniform procedure is not so general. It is still all too common to find surgeons closing the lip first, depending upon the traction of the orbicularis oris muscle to accomplish the desired effect upon the bones; or passing a single wire through the anterior part of the separated maxillae, thus bringing them together. The closing of the lip and the resultant traction of the orbicularis oris muscle *will* gradually move the anterior part of the cleft bones into contact, but the bones will not, as a rule, be normally approximated or united. The bone carrying the premaxilla protrudes beyond the maxilla of the opposite side, leaving an ugly malformation of the nose and arch. Besides, there cannot be union of the bones with the mucoperiosteum intervening. They may not even meet, they remain malposed and leave the patient deformed throughout life.

A wire suture passed through the anterior part of the cleft bones will often cut out. It is more than likely to do so unless an incision is made over the line of union between the maxilla and premaxilla of the side opposite the cleft, the anterior half of the bone separated, the protruding premaxilla crowded downward, either bending or fracturing the lingual surfaces of the bone, so that an approximation of the cleft in the alveolar processes may be made.

MANAGEMENT OF PREMAXILLAE (FIG. 1)

A review of the literature convinces me that protruding premaxillae have never received the careful attention which has marked the investigations of surgeons in treating other physical defects. Some authors advise excising the bones; others advocate closing the lip over them when possible; still others advise removing a V-shaped piece from the vomer, moving the bones back and closing the lip over them. We often find the vomer divided, the premaxillae moved backward, the cleft lip closed and no effort made to freshen, approximate and stabilize the bones.

Protruding premaxillae, separated as they are from the maxillae, should be considered as a recent fracture and so treated. ***Under no circumstances should the premaxillae,*** even though they amount to only a small tubercle on the tip of the nose, ***be removed.*** These bones, together with the teeth which they embrace, have an important function. They add symmetry and beauty and impart normal contour to the face. Their loss means prognathism with its unsightly deformity. The upper lip recedes and the nose becomes broad and flattened. The superior arch becomes contracted so that the upper teeth

Fig. 1.—Profile of patient with protruding premaxillae.

occlude on the lingual surfaces of the lower. The loss of these bones is always unnecessary, unsurgical and should be deplored. Neither should they be excised nor simply forced back (Fig. 2). Would a surgeon feel that his duty was well done in the treatment of a compound fracture of the femur if he crowded the fragments into place without removing the intervening tissue and then closed the external wound? Would he expect to secure bony union without the application of splints and without immobilizing the parts? Similarly, a normal maxillary arch can be secured only by treating the parts in the same manner as one would handle a fracture, i.e., remove intervening soft tissues and approximate the bony fragments.

The premaxillae should therefore be moved into place after freshening the surfaces which are to come into contact. The compact bone should be removed and the freshened surfaces of cancellated bone placed in contact and immobilized. When this is done, the soft tissues covering the bones may be sutured with horsehair. To divide the vomer, move the premaxillae back and make no attempt to unite them to the maxillae, is unsurgical, cannot produce a normal arch and may be likened to the treatment of a fracture

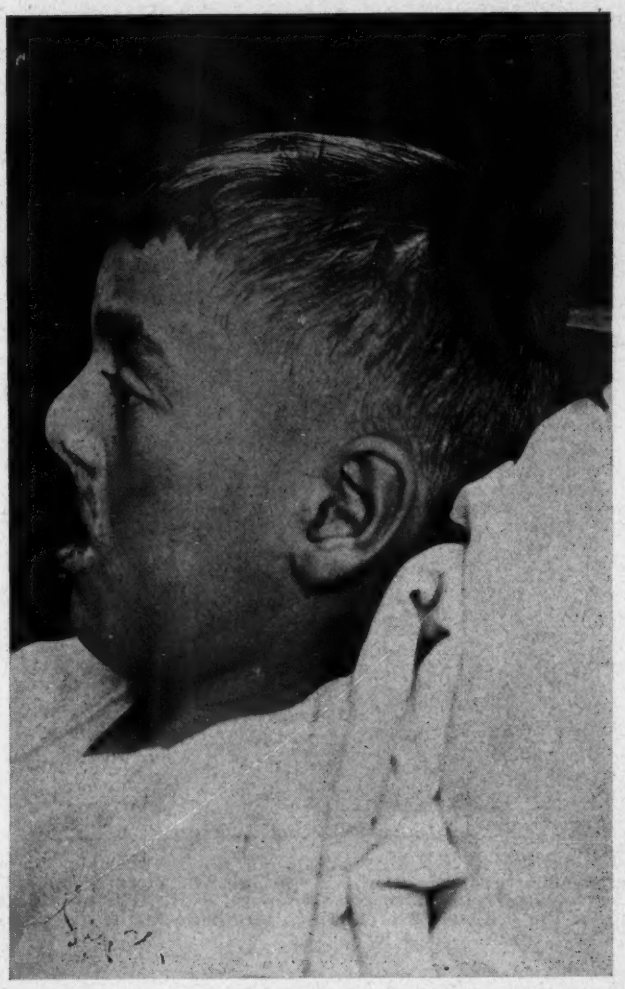

Fig. 2.—Result following the excision of the premaxillae. Note contraction of upper lip and protrusion of the lower. (Author's case.)

elsewhere without assuring bony contact and immobilization with resulting non-union. The wires should not be passed through the premaxillae but anterior to them and beneath the soft parts.

An attempt to move the premaxillae backward should not be made in a patient younger than three months, because the bones have not become sufficiently ossified to form well defined alveoli. Besides, the lateral surfaces of the teeth are often covered by the soft parts only. Obviously, the teeth at this early age may be easily displaced.

ADJUSTING WIRE SUTURES

Introducing the wires is not difficult for the surgeon who knows the technic. Passing the wires through the maxillary bones in the usual way anteriorly and posteriorly and adjusting the lead plates enables the operator to approximate the alveolar processes and at least one-third of the palatal plates of the maxillae, moving and holding the tuberosities in normal position, so that when the soft palate is united it will be of normal length and flexibility. When the posterior two-thirds of the maxillary plates are elevated at an angle of 45 to 75 degrees, their borders do not meet (Fig. 3). The abnormal elevation of the posterior two-thirds of the horizontal processes of the maxillary bones is lowered by means of the wires and lead plates (Fig. 4).

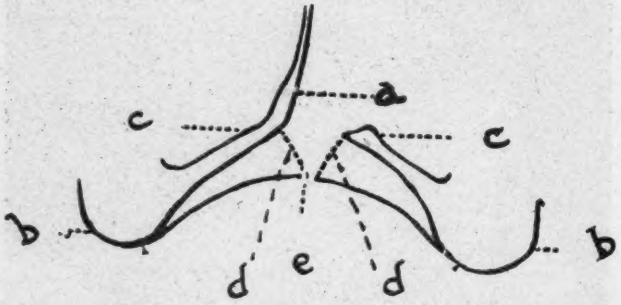

Fig. 3.—Illustration showing the position of the horizontal plates of the maxillae and the vomer, as they usually appear in single cleft lip and cleft palate. *b—b*, alveolar processes; *c—c*, horizontal plates; *a*, vomer; *e*, separation of the hard palate as it would be if the horizontal plates were lowered; *d—d*, lines of descending arch.

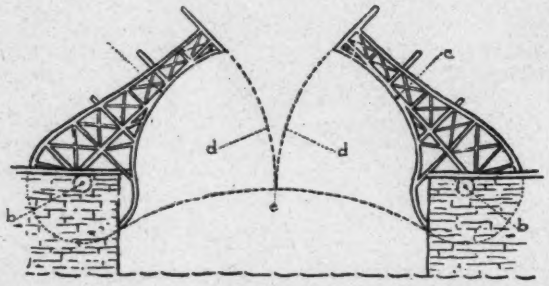

Fig. 4.—Following the lettering of Fig. 3 as far as possible, for we have no *a*, to represent the vomer, *b—b* are the pinions of the bridge which correspond to *b—b*, the alveolar processes in Fig. 3; *c—c*, correspond to the horizontal plates of the palate bones, misplaced upwards; *d—d*, lines of the descending arch which terminate in the meeting of the hemispheres of the bridge at *e*.

Criticisms have been offered by men inexperienced in using lead plates or without the opportunity to observe their proper use, that they are likely to produce necrosis of the bone. I have never had nor have I ever seen a case of necrosis of bone follow the correct use of lead plates. If it occurs it is due to defective technic. Recently a patient returned to me who had worn these plates for two years, without the slightest inconvenience and without injury to the parts.

SPREADING OF THE TUBEROSITIES

I have spoken of the closing of the lip first as one means of approximating the separated bones. The lip operation is one of the oldest in the annals

of surgery, being described by Celsus, who was a contemporary of Tiberius (42 B. C. to 37 A. D.).

When the anterior part of the cleft is brought together either by the lip traction plan or by the single wire, the surgeon fails to give consideration to the consequent separation of the bones posteriorly. Every surgeon experienced in this work realizes that oftentimes these bones are widely separated posteriorly, due to the moving together of the anterior part of the cleft and action of the muscles and they cannot assume a normal position unless measures are employed to overcome this separation. The maxillae act as levers, the malar processes becoming the fulcrums, and as the anterior ends of the maxillae are drawn together the posterior ends move apart (Fig. 5).

Unless steps are taken in early infancy to prevent the tuberosities from spreading (as by the use of wires not only anteriorly but posteriorly) the

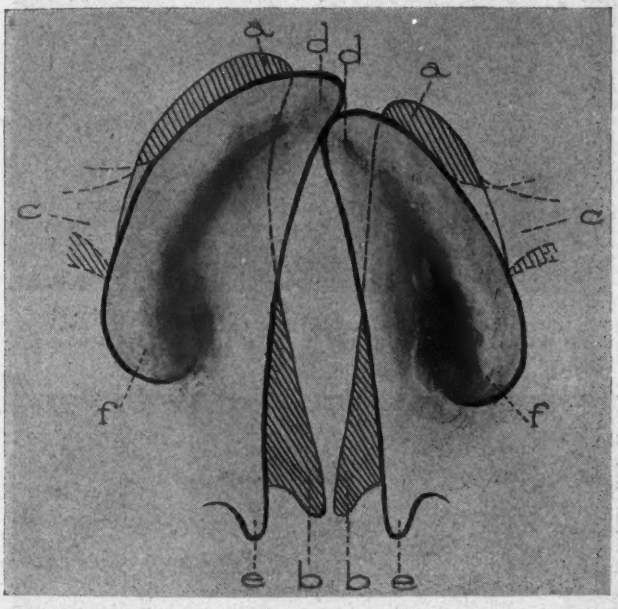

Fig. 5.—Drawing showing change in position of the palate and alveolar processes due to either contraction of the orbicularis oris muscle after the lip operation or the result of moving the anterior alveolar processes together.

a—a. Bones widely separated at birth.

b—b. Posterior part of cleft at birth.

d—d. Anterior part of cleft after alveolar processes are moved together but not united.

e—e. Posterior part of cleft has widened. As the anterior part moves together the posterior part separates.

c—c. The malar processes, the pivots upon which the leverage is exerted to move the posterior parts outward while the anterior parts are moved inward.

f—f. The tuberosities widely separated as the result of failure to move them together or to prevent them from separating.

bones will widely separate and the palate will be shortened to such an extent that perfect speech will seldom be secured. When the tuberosities are abnormally separated the soft palate, when united, will be put on the stretch and consequently shortened so that it cannot reach the postpharyngeal wall; it will be like a drumhead without flexibility or resilience. If lateral incisions are made through the soft palate in an attempt to relieve the tension a great mass of cicatricial tissue will result, making it thick, unwieldy and inflexible.

It must be remembered that lateral incisions oftentimes divide the fibers of the tensor palati muscle, which has a two-fold function—that of making tension on the palate and dilating the pharyngeal orifice of the Eustachian tube during the act of swallowing. The result of the division of this muscle may thus lead to early defective hearing, due to destruction of the continuity of the muscle and consequent failure of the normal dilation of the pharyngeal orifice of the Eustachian tube. When operating on the soft palate, the

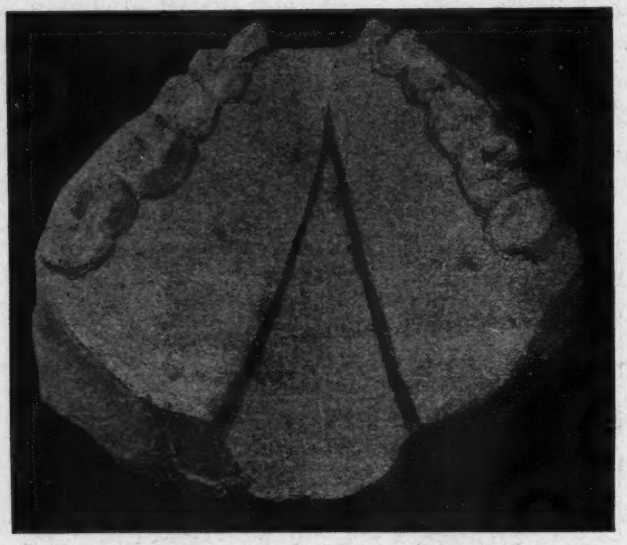

Fig. 6.—Cast showing the premaxillae removed, and extremely broad cleft of the palate. The distance between the buccal surfaces of the third molars is 3⅝ inches. (Author's case.)

Fig. 7.—Lower arch equally broad. Compare with preceding figure.

posterior wire should be passed as nearly as possible through the center of the tensor palati muscle as it swings around the hamular process, thus suspending the contraction of the muscle until the hemispheres of the palate unite.

I regret that I have not time to discuss the plastic surgery of the lip, the management of the defective nostril and the operation upon the nose, operations so important in rounding out the work of making normal these patients who are the victims of such distressing conditions. But what does

it avail, to produce the most careful and painstaking operation on the lip, if underneath there is an improper foundation for this superstructure? There must first be provided a normal, well-rounded arch upon which to build a well-shaped lip and there must be a normal position of the tuberosities in order that a flexible, resilient soft palate of sufficient length may be produced. (Figs. 6 and 7 contrast the two arches.)

IMPORTANT POINTS TO BE OBSERVED IN CLOSING PALATAL CLEFTS

My observation has been that function often has not been considered as an object to be attained. It seems that operators too frequently aim to close the cleft without achieving the all-important anatomical functional result. As I have said, function is dependent more on preventing the tuberosi-

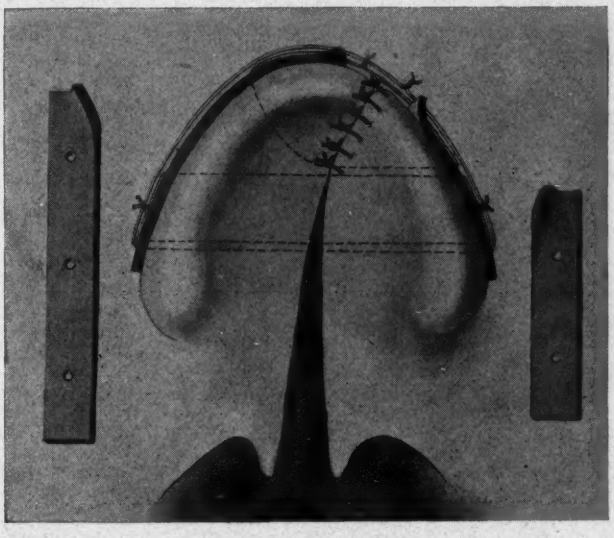

Fig. 8.—All wires and plates in position, maintaining the parts in quiet contact until union is accomplished. Lead plates, No. 13 American gauge, shown at sides, perforated for the passage of the wires.

ties from spreading than any other factor. When they *are* spread in young infants they must be narrowed to their normal breadth.

Moving the bones together in the anterior part of the cleft without attempting to prevent the tuberosities, which are oftentimes already abnormally separated, from further spreading contributes to the making of a short palate followed by defective speech. Spreading of the tuberosities makes the palate too short and a palate too short makes the function of speech defective. The surgeon who permits the tuberosities of the maxillae to spread, thus making it impossible to secure a long palate, will meet with failure in his results and usually correct speech will be made impossible. In such cases, to make a palate that will reach the postpharyngeal wall, a section of each of the palatopharyngeal muscles may be added to it.

When the bones are separated at birth, there is only one logical course to pursue, that is to freshen the surfaces that should be united as would be done with fracture of any other bone and approximate and immobilize the

fragments. All general surgeons *do* so treat fractured bones. The *separated* bones of the palate should receive like treatment (Fig. 8).

To fail to unite the bones in early infancy usually leaves a deformity throughout life. A long, flexible soft palate, correctly functioning, is largely dependent upon a normal bony arch.

The surgeon, after operating on a soft palate in a youth or adult, finds the united palate tense and short. He reasons it is due to atrophy prior to the operation. It may be due in part to atrophy, but in a large majority of such cases spreading of the bones is an important factor in making the palate short, tense and drumhead-like.

The mattress suture is often valuable in the muscular tissues, but the interrupted suture is more desirable in the mucoperiosteum with an occasional mattress (end to end) suture.

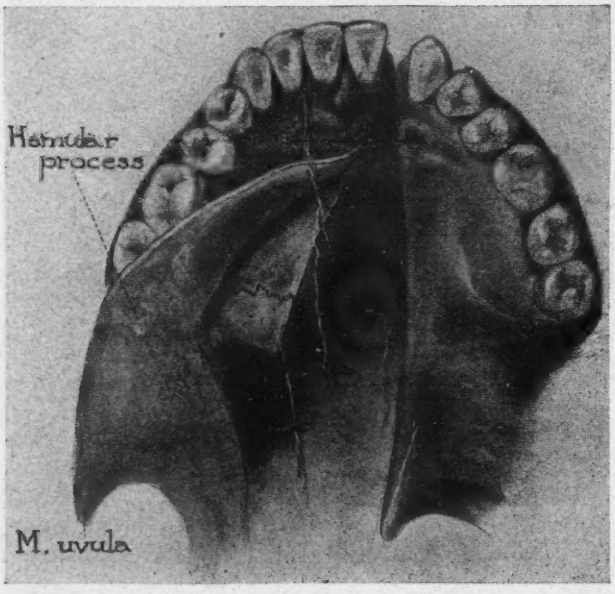

Fig. 9.—The muco-periosteum is denuded from the bones of the palate as far back as the hamular process of the sphenoid bone. The flaps are then approximated and united.

Tension of the palate is relieved to a great extent by lowering it as far laterally as the hamular process instead of making incisions in muscular tissue (Fig. 9). Failure of union of the soft parts is often due to failure to properly denude the bones of the mucoperiosteum and to improper suturing. An operator sometimes fails by making his sutures too tight. He must bear in mind that the tissues will not stand pressure and stretching; there must be relaxation sufficient to insure good circulation. Failure of union of the soft parts is sometimes due to the cutting out of sutures. The proper use of silver wires and lead plates will avoid this.

The lead plates (Fig. 10) are not intended to be used for stretching the palate and pulling the edges together, but are to be used when the wires are inserted and the palate sutured—when the plates are put gently in contact with the mucous membrane and the wires twisted, but without tension. The

plates are to prevent the sutures from cutting out and to hold the edges of the cleft steadily together. They also act as splints, so that when the palate moves it moves *en masse*. Dr. Hayes Agnew cut the tensor palati muscles to relieve tension. The wires and plates relieve tension without destroying the function of the muscles.

Extending over a period of forty years, we have read from time to time of devices—plates, et cetera—used to prevent the tongue from interfering with the newly approximated surfaces of the palate. Their use, however,

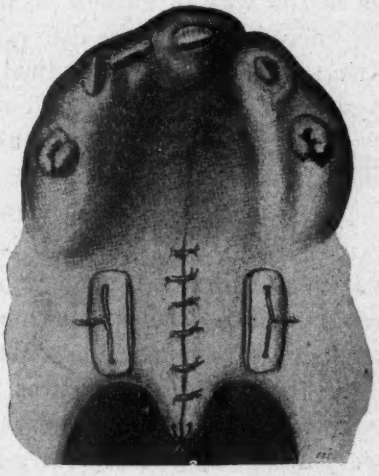

Fig. 10.—Lead plates in position. They must be free from sharp corners and edges, and the wires not too tight lest the tissues be cut.

Fig. 11.—Upper centrals.

has been transient. The wires with which the lead plates are fixed are bent down in such a way that they do not lacerate the tongue but make contact of the tongue with them uncomfortable, thus avoiding disturbance of the palate.

It is the duty of the surgeon to see that the plates are properly adjusted. If they are not properly adjusted, if they are made too tight, if they are so placed that they will cut the tissues failure is likely to follow.

The palate demands thorough cleanliness. Only by daily observation on the part of the surgeon and cleanliness on the part of the nurse, may the highest degree of success in treating cleft palate be achieved.

CONCLUSIONS

There are no operations in the whole broad field of surgery in which so large a percentage of failures occur as in palatal surgery. It must be remembered that the most careful operator, who has performed a perfect operation, may fail to secure a good result because of specific disease. Moreover, sometimes a most promising case coupled with the greatest care and perfect technic may result in failure on account of conditions beyond the surgeon's control.

The greatest obstacle in the way of success in maxillo-palatal surgery is a lack of knowledge of the correct age for the different steps and the methods of procedure. So long as the majority of medical colleges utterly fail to teach their students this subject, just so long will the principles underlying the surgery of the palate be misunderstood and, as in the past, there will continue to be innumerable failures in operations.

Those who operate on cleft palate only occasionally and the uninformed do not realize that maxillo-labio-palatal surgery is a vast field for study and practice. When we see mutilations, such as amputation of the premaxillae, et cetera, which cannot be too strongly condemned, when we see that many without a knowledge of the fundamentals of the subjects are continuing these practices, we feel that all measures available should be employed to stimulate the study of oral surgery and thus avert such calamities.

It must appeal to every surgeon, who logically looks upon the situation, that articles which have appeared in certain textbooks in the United States, England, France, Spain and some other countries, repeating the writings of authors of hundreds of years ago on the treatment of cleft palate, are antiquated and do not set forth the truths that have been revealed up to this period.

The author of a textbook assumes a great and solemn responsibility. Every child who is operated on by a surgeon whose knowledge in treating these cases was acquired by *reading* a textbook with such teachings as the excision of the premaxillae and consequent permanent mutilation of the patient, may well place the responsibility of this procedure at the door of the author.

DISCUSSION

Dr. Carl W. Waldron.—It has certainly been a great privilege to be here tonight and hear Dr. Brophy give his experience during what is more than the span of lifetime of most of us here, an experience that has been fraught with many disappointments in some ways but yet always increasing and attaining more perfection.

Those of us who have made a study of Dr. Brophy's textbook will realize that tonight he has given us some ideas that are not incorporated in his textbook, particularly with reference to the time of the bone operation. I think eight or ten years ago Dr. Brophy was far more anxious to operate within the first week of life of the tiny infant than he is today. He has learned from experience that there is developed with the alveolar process greater protection of the developing teeth by waiting for a certain period of time, but not waiting too long; not waiting until the time when the process of molding, digital molding of the bones is made difficult by ossification.

This is one detail we might discuss for a minute—this matter of molding. Some of the observers, particularly Thompson, of Galveston, lay particular stress on this feature:

during the operative procedure on the alveolar process, time should be taken; not too much hurry to insert wires, for instance. Take plenty of time to do what he calls digital molding, using plenty of firm, re-applied force to approximate the separated bony processes, and then hold them with the wires rather than to use the wires as a means of drawing them together. I think this is an important point. I feel that it has been so in my own practice. In taking care of these patients I take plenty of time to bring the parts together as well as possible with firm pressure of the thumbs. I might state that in my own experience the very process sometimes tires me out. My hands will ache for some time afterwards; it is somewhat difficult.

Dr. Brophy's emphasis of the importance of bony contact and immobilization is well taken. I feel that it is an important part of the operative procedure. There is one thing that might be mentioned and that is that I feel most anatomists agree that the smaller fragment in a unilateral cleft is in a relatively normal position as far as its lateral position is concerned, the displacement being an upward one of the palatal process. So in molding we must pay particular attention to the larger fragment to bring it over and approximate it to the smaller fragment and then hold it with the wiring.

I would like to ask Dr. Brophy one question with reference to bony union. Those of you who have read some of Dr. Ritchie's articles on this subject—and we are sorry that he is not here tonight because we would like to have him present his ideas on the question of preliminary lip closure—Dr. Ritchie says he has yet to see evidence of bony union as shown by the x-ray. I would like to ask Dr. Brophy if he has made any systematic record postoperatively, that is, three or four years after operation, of the presence of bony union by the use of dental films and careful x-ray studies.

There is another thing: this question of the single wire. I think if we are looking upon our wires as a means of approximation that the single wiring without the use of plates should be condemned; whereas if we carry out, as I described previously, the careful molding, in many cases a single wire if placed sufficiently posteriorly from the anterior cleft will suffice. I am sure that many men are getting excellent results by such a method. This problem of the spreading of the tuberosities also hinges upon the question of the placement of the wire and somewhat on the preliminary molding. I feel that it will not take place if the molding has been done very carefully and the wires are put in carefully.

Now we have the problem of the soft palate—Dr. Brophy feels that the lead plates are essential insofar as the control of tension is concerned. I think Dr. Ritchie has added to our knowledge in the handling of the muscle problem in the lip and palate operations by his careful denudation, not by cutting away muscle but by a wide exposure of muscle fibers and the use of muscle sutures. I believe that to date he has had no muscle separation and no separation of the soft palate following operation. He has not to my knowledge resorted to the use of plates.

There is one important point in connection with the closure of the hard palate and that is that measurements should be taken. We should estimate for instance the distance from the alveolar process to the alveolar process just anterior to the position of the tuberosity, and then measure again the widths from that point to the margin of the cleft and determine whether there is sufficient tissue. If it is not there, wait for it to grow. We must figure that it is better in these cases to wait a year and if necessary make more extensive use of all our aids in the training of speech, and at the same time be sure of a closure; rather than to operate before for instance the fifteenth or sixteenth month of age and take a chance on the closure. It is much better, I feel, to wait for another year perhaps until we know by our measurements—say the measurements of a plaster cast that we can make from an impression—that we have sufficient tissue and can at least expect a closure at perhaps two operations, if not successful at the first attempt.

The question of the operative closure of the recurrent perforations was not taken up by Dr. Brophy. I feel that the delayed flap, which is a modification of the flaps we used a great deal in war surgery, is an advance in the hazardous undertaking of closing some of these recurrent perforations where the blood supply is not as perfect as we might hope.

I would like to ask Dr. Brophy where the special nipples may be obtained for use in

feeding these posterior cleft cases, while waiting a year or two for the time for the operative closure to be performed.

In closing I want to again thank Dr. Brophy for the treat he has given us tonight and to assure him that when I go to Chicago I shall always call on him to see the good work he is doing.

Dr. R. E. Farr.—I would hardly have the temerity to discuss this subject in the presence of Dr. Brophy excepting that I wish to add a word regarding my esteem for Dr. Brophy and the work he has done. My notion for many years has been that cleft palate surgery began with Brophy and ended with Brophy. My feeling is that twenty or perhaps fifty years from now the work that Dr. Brophy has done will be much more appreciated than it is at the present time.

My experience is limited and yet a large percentage of the cases that have come to me have been operated upon by methods which Dr. Brophy does not and never has advocated. Generally these patients have been operated upon by the preliminary closure of the lip. Several years ago I showed four pictures of children from eight to twenty years of age with the forefinger of each lying in the cleft between the bones, and these children had all had the lip closed within the first three months.

The whole question before us is: shall we repose the bone or not? This picture tells the story. Here is a photograph of a little baby before the wiring. A line down the center of the face cuts the ala on the side of the cleft about at the midpoint, that is, three-quarters of the way between one ala and the other. There is three-quarters of the nose on one side and one-quarter on the other. After the wiring, in every case in which we have been successful we have had an absolutely symmetrical face as shown in the next slide.

For many, many years Dr. Brophy has been kind enough to show me every detail of this operation. The only objection to it that I have is that it is more difficult in most people's hands than it is in the hands of Dr. Brophy. We have trouble with our anesthesia. We have difficulty in getting our landmarks, getting our wires high enough and far enough back. I think we too often tilt the bones.

This is the first time I have ever seen Dr. Brophy have time enough at a meeting to discuss the subject fully. I have not been where he has been the guest of honor like this, where he had the whole meeting and where he could discuss all of the points. I am certain that if his message takes root in this audience and his enthusiasm is transmitted to us he is going to save a great many children in the future from carrying these defects through life. Of course Dr. Brophy cannot do all of these operations. I wish to goodness he could. In regard to that last picture he put on the screen in which the lips had been stretched to such an enormous size I would suggest that a "lipectomy" be performed.

Dr. Brophy (closing).—Replying to Dr. Waldron, I no longer operate upon patients a few days old and for the reasons he gives. The child should live long enough before operation to have all organs functioning well. I depend upon a pediatrician to get the child into proper condition.

I did not hear anyone state what other method could be used in the case taken from James Barry in order to close the cleft. Isn't it proper to bring the bones into normal position? I do not agree with Dr. Waldron that a single wire will accomplish the reposition of the bones. It will not hold the tuberosities in position and we know that the soft palate cannot be depended upon to do so. I should like to ask Dr. Waldron if, in his work, or that of Dr. Ritchie, where the anterior closure alone had been made, the soft palate after operation was long enough to reach the postpharyngeal wall. If it is not, the patient will not speak well.

The most eloquent answer that can be made to the question brought up by Dr. Waldron regarding whether or not bony union takes place may be had by referring to Figure II. It is so certain that bony union does take place that I have never heretofore thought it necessary to offer concrete evidence. If it were necessary, thousands of such cases could be presented.

Dr. Farr has spoken kindly about the work I have been doing. I have simply tried to be conscientious and do the right thing and yet I have been criticised a great deal and some of my friends think that I should be in jail.

In conclusion, I feel certain that the man who makes a success of this work, bringing about a condition which will enable patients to go through life with the nose in the center of the face, a completely closed cleft and articulating distinctly, will not do it by using a single wire in the front. Personal appearance and function are the essentials. I am not particular how you obtain the results but have tried to show a method of meeting the indications. It is a notorious fact that cleft palate cases, the world over, usually fail to receive efficient treatment.

COMMUNICATION

81 East Madison St.,
Chicago, May 19, 1924.

TO THE EDITOR:

On December 6th, 1923, I read, by invitation, a paper on Cleft Palate before the Minneapolis Surgical Society.

In my illustrations, shown during the lecture, I exhibited a number of pictures showing union established between the maxillary and premaxillary bones. But in the discussion, Dr. Waldron said: "I would like to ask Dr. Brophy one question with reference to bony union. Those of you who have read some of Dr. Ritchie's articles on this subject—and we are sorry that he is not here tonight because we would like to have him present his ideas

Case I. Fig. 1.—X-ray photograph of palate of child of about two years showing perfect union of premaxillary with maxillary bones. All deciduous teeth are in place, though not all fully erupted; permanent central incisors shown in formation.

on the question of preliminary lip closure—Dr. Ritchie says he has yet to see evidence of bony union as shown by the x-ray. I would like to ask Dr. Brophy if he has made any systematic record postoperatively, that is, three or four years after operation, of the presence of bony union by the use of dental films and careful x-ray studies."

I had no x-ray pictures with me in Minneapolis to show union of the bones, but I have had hundreds of patients for whom such union has been secured, and others in Chicago and elsewhere have been operating and securing union of these bones most satisfactorily.

In order that I may settle this question in the minds of those who have not seen union in such cases, I am sending to you for publication in your journal, x-ray pictures and photographs of plaster casts of the mouth of a child, taken at the age of a little more than two years. The bone operation, moving into position the protruding premaxillae and uniting them to the maxillae, was done when the child was about three months old; the lip was not done until more than 18 months later because the parents could not come to the hospital; and the soft palate is yet to be closed.

In these illustrations, perfect *union of bone is clearly shown;* and a well defined arch with teeth in correct position. All of the deciduous teeth are shown, but some of them are not fully erupted. Two permanent central incisor teeth are in formation and shown in the x-ray. The occlusion is good, as will be seen. It will also be seen that the tuberosities are in normal position. The cleft of the soft palate is, consequently, very narrow and abundantly long so when united it will easily close the nasopharyngeal opening.

Case I. Fig. 2.—Cast of upper arch, showing teeth in normal position. The first molars and cuspids are not completely erupted. This case shows the value of retaining the tuberosities in normal position, leaving the soft parts only slightly separated and the palate, when united, long enough to close the naso-pharyngeal opening.

Case I. Fig. 3.—Cast of mandible. Shows well formed arch, with eight deciduous teeth erupted.

I have just returned from California and this is my first opportunity to address you on this subject. However, these illustrations can be duplicated many times from patients of mine and of other surgeons who follow a course of treatment such as I have outlined in this and other papers.

I am satisfied that those who have not seen cases where perfect union has been established between the premaxillary and the maxillary bones, have seen cases which were not properly operated. I wish to reiterate what I said in my Minneapolis paper: The premaxillae should be moved into place after freshening the surfaces which are to come into contact. The compact bone should be removed and the freshened surfaces of cancellated bone placed in contact and immobilized. When this is done, the soft tissues covering the bones may be sutured with horsehair. To divide the vomer, move the premaxillae back and

Case I. Fig. 4.—Upper and lower arches in normal occlusion, though molars and cuspids not fully erupted.

make no attempt to unite them to the maxillae is unsurgical, cannot produce a normal arch and may be likened to the treatment of a fracture elsewhere without insuring contact of freshened surfaces and immobilization. It is well known that such treatment would result in nonunion.

To establish union between the premaxillae and the maxillae, such procedure as I have advised must be followed. Those who do not follow this practice will meet with failure—and it is following such failure, I am sure, that Dr. Ritchie's observations have been made.

I have no other motive in this matter than to assist in making known a very important technic in establishing normality of the separated and misplaced bones.

Very truly and fraternally yours,

TRUMAN W. BROPHY.

DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., F.A.C.D.,
and Howard R. Raper, D.D.S., F.A.C.D.

THE IMPORTANCE OF RADIOGRAPHY IN ORTHODONTIA*

By Charles R. Baker, D.D.S, Evanston, Ill.

THE use of the roentgen ray is a necessity in the practice of orthodontia. My first knowledge of the subject was acquired during my final year at the dental school, about twenty-one years ago, when I saw a picture that had been made of some unerupted teeth. I call it a picture because in the early days of this work, the radiographer printed pictures from the films on photographic paper. Some of the accompanying illustrations are made from such prints, or positives, and will therefore appear as the opposites of the films.

Fifteen to twenty years ago, the orthodontist seldom considered the use of a radiogram unless he wanted to locate an unerupted tooth or ascertain the cause of some tumor in the mouth. It was usually quite a task to persuade parents to consent to the procedure on account of their fear of burns or other injury.

In many instances the pioneer radiographer not only made the pictures but also gave the patient information concerning the conditions present and advice as to proper treatment. This was sometimes a source of embarrassment to the orthodontist, who, after studying the case from every angle, decided upon a course of treatment which was not in accord with the suggestions of the radiographer. I am glad to state that these conditions do not now prevail. The present day radiographer sends the films to the orthodontist, who uses them in conjunction with casts of the mouth, photographs and his personal knowledge of the individual case in making a diagnosis or to check up on the progress of the treatment. He also cheerfully cooperates, upon request, in interpreting the films and makes new pictures if they are required for any reason.

The value of the roentgen ray in orthodontia is quite obvious and I

*Read before the American Society of Dental Radiographers, Chicago, Ill., January 15-16, 1924.

want to state frankly that I have nothing new to present. However, I will illustrate a number of conditions where the radiogram has been of great importance; it is truly an essential aid in diagnosis and treatment.

Usually, intraoral films are used but in some instances, particularly in cases of very young patients, the extraoral film or plate is considered preferable. Occasionally a picture taken from directly above or below is necessary to show whether teeth are to the buccal or lingual of the line of occlusion.

Fig. 1 shows a case where the maxillary left central incisor was in torsiversion. Before attempting treatment, a radiogram was advised to show whether or not the root of this tooth was normal in shape or if supernumerary

Fig. 1.

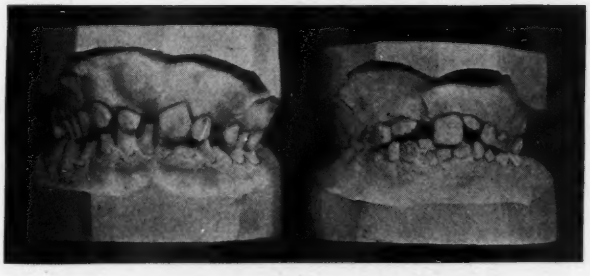

Fig. 2.

teeth were present. The parents objected strenuously to this but finally consented after I refused to treat the case without a radiographic examination. The film shows a supernumerary tooth, shaped like a small canine, located between the central incisor roots, with the crown portion upward. This was removed and the case successfully treated. I might add that the boy's parents were very grateful for the use of the radiogram.

Fig. 2 shows the casts of a brother and sister and it is interesting to note the similarity in malocclusion. There was not enough space in the arches for the unerupted maxillary right central incisors. These casts were made when one patient was eight years old and the other ten years. There is a difference of six and one-half years in the ages of the patients. Fig. 3

shows the presence of the normal incisor and also two supernumerary teeth in one of the cases. Fig. 4 shows the normal incisor and one supernumerary tooth in the other case. The presence of supernumerary teeth frequently interferes with the normal eruption of other teeth.

In the case shown in Fig. 5 the maxillary left lateral incisor had failed to erupt and there was a swelling to the lingual of this region. The radiogram showed the presence of the lateral incisor as well as one supernumerary tooth.

Fig. 6. Here the deciduous maxillary left central incisor remained in position long after the usual time for its loss. The film shows the presence

Fig. 3.

Fig. 4.

Fig. 5.

of the normal central incisor as well as one supernumerary tooth. The deciduous incisor and supernumerary tooth were removed and the permanent central incisor soon erupted.

Fig. 7. In this case a supernumerary tooth began to erupt just to the lingual of the maxillary central incisors. A radiogram was made which showed the normal number of teeth with the exception of this supernumerary, which was removed, allowing the other teeth to erupt.

Fig. 8. In this case a large supernumerary tooth occupied the maxil-

lary left central incisor position and there was a history of another supernumerary tooth having been removed from a position lingual to the maxillary incisors. The film shows that the permanent central incisor is present. The supernumerary tooth was removed and the central incisor erupted. There was a large area of absorption of the root of the supernumerary tooth caused by pressure of the permanent central incisor. This indicates the

Fig. 6.

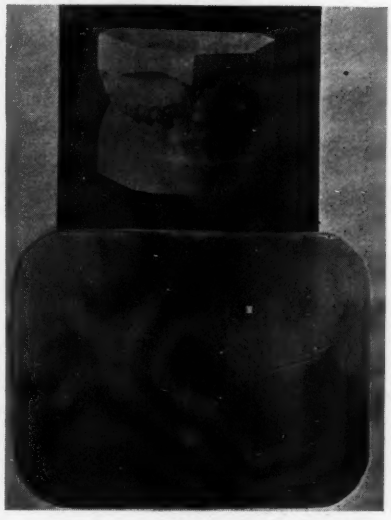

Fig. 7.

Fig. 8.

Fig. 9.

advisability of always removing unerupted teeth by orthodontic or other means if there is danger of contact with the roots of other teeth.

Fig. 9 shows a large supernumerary tooth fused to a maxillary right first premolar, which prevented the eruption of the canine.

Fig. 10. This patient lost the mandibular left deciduous first molar when eight years old and a tooth began to erupt in this region. The tip of this tooth did not resemble a first premolar so a radiogram was made which

showed that it was the permanent mandibular left lateral incisor. The mandibular deciduous left lateral incisor and canine were removed and the permanent lateral incisor moved into its normal position.

In the case shown in Fig. 11 no permanent maxillary lateral incisors were present and the canines were in contact with the central incisors. De-

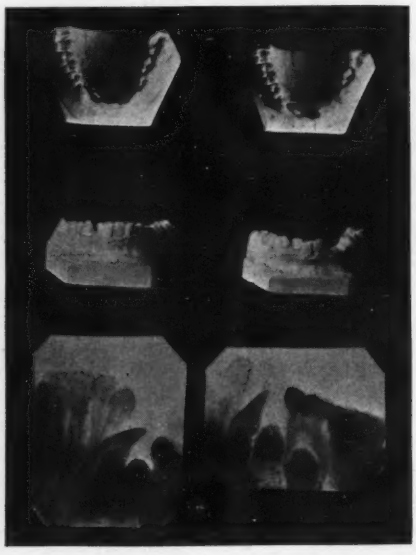

Fig. 10.

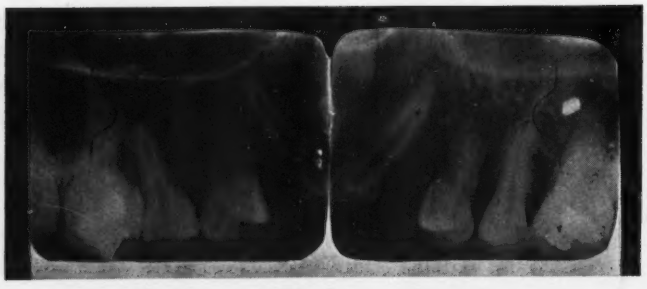

Fig. 11.

Fig. 12.

ciduous canines were in position between the permanent canines and first premolars.

Fig. 12. This patient had lost the mandibular deciduous second molars prematurely and there was not enough room for the eruption of the second premolars.

Fig. 13. In this case there were no maxillary left premolars present in the arch. The radiogram revealed a tooth which may be one of the premolars in a position above the roots of the first and second molars.

Fig. 14. In this mouth there was not enought room for the eruption of the maxillary right second premolar or the mandibular right second premolar. The film shows that the maxillary second premolar was present while the mandibular second premolar was missing.

Fig. 15. There was no room for the eruption of the maxillary second

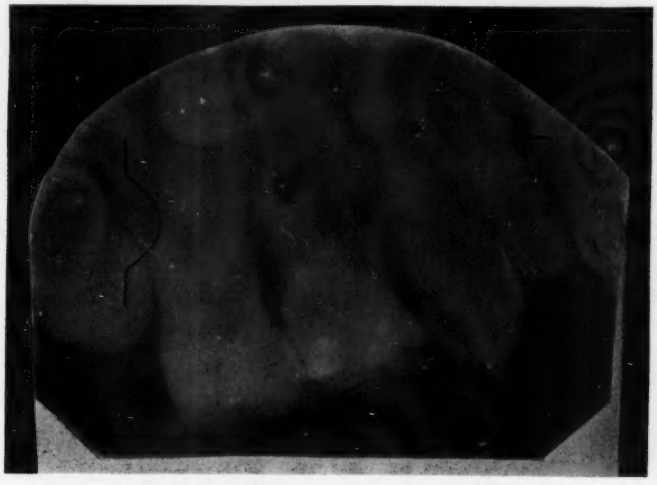

Fig. 13.

Fig. 14.

premolars in this case. The picture shows that the teeth were present and a later picture illustrates the progress of the case and the development of these teeth.

In the case shown in Fig. 16 the mandibular left second premolar failed to erupt and a radiogram showed that the tooth was present but occupying an abnormal position. A later film shows some development of the tooth but no apparent improvement in the location or position.

Fig. 17. Here the maxillary left canine erupted to the labial and slightly to the mesial of the lateral incisor. The film, which I was unable to locate,

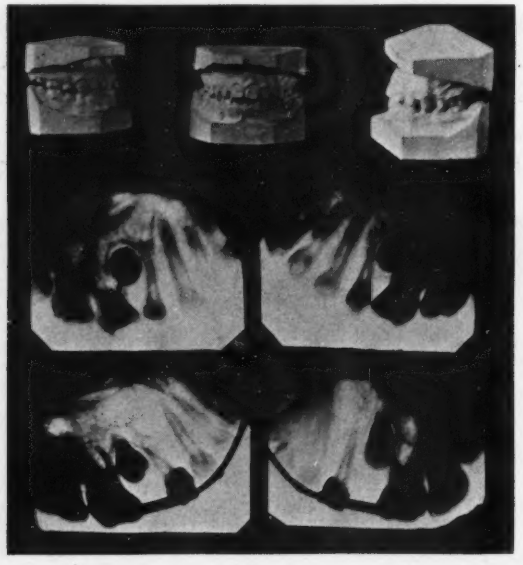

Fig. 15.

Fig. 16.

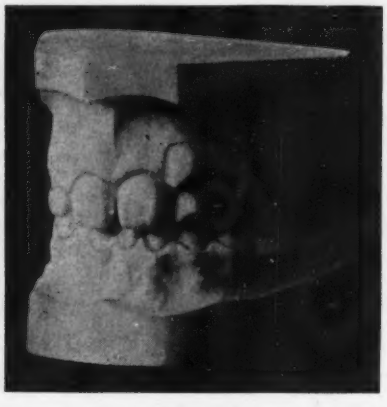

Fig. 17.

indicated that no supernumerary teeth were present and that these two teeth were not fused together.

Fig. 18. This patient had normal deciduous maxillary lateral incisors

but peg-shaped permanent maxillary laterals. The separation of the maxillary centrals was probably due to the small size of the permanent lateral incisors. The second cast was made after the case had received some orthodontic treatment.

Fig. 18.

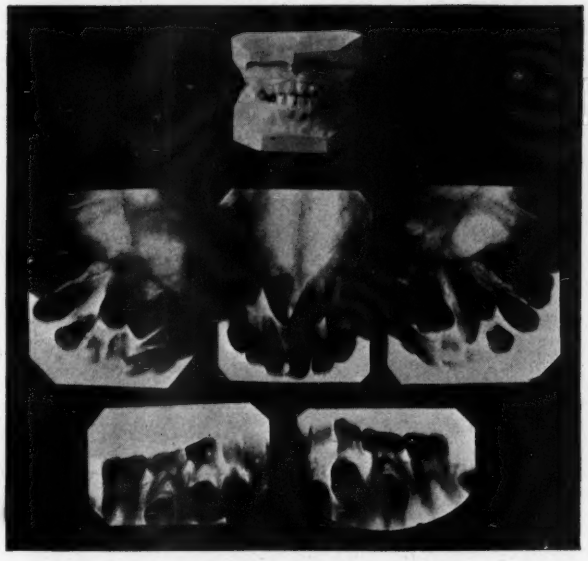

Fig. 19.

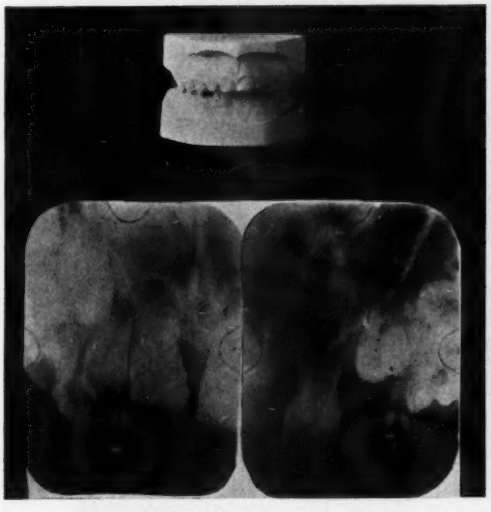

Fig. 20.

Fig. 21.

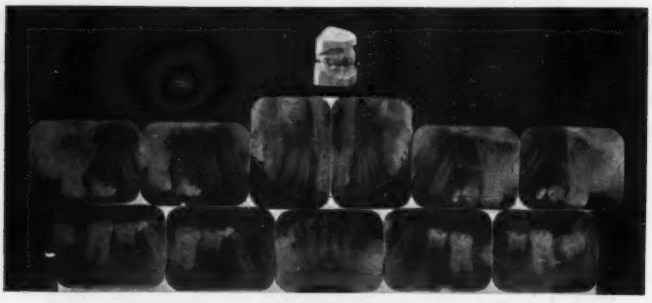

Fig. 22.

Fig. 23.

Fig. 24.

Fig. 19 shows the case of a large, well developed boy, aged thirteen, who had retained his maxillary deciduous central and lateral incisors, canines and

Fig. 25.

Fig. 26.

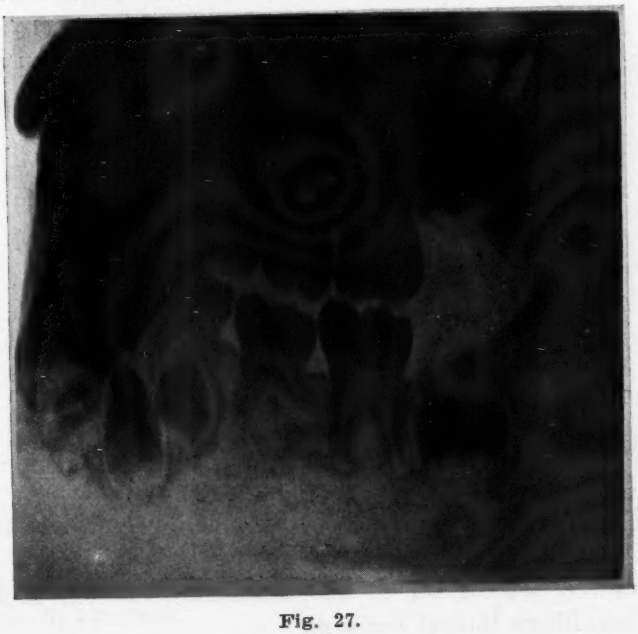

Fig. 27.

second deciduous molars, the only permanent maxillary teeth in place being the first premolars and first molars. In the mandibular arch the deciduous canines and molars were present. (The cast was made after the mandibular deciduous teeth had been removed.) The pictures show the presence of all of the

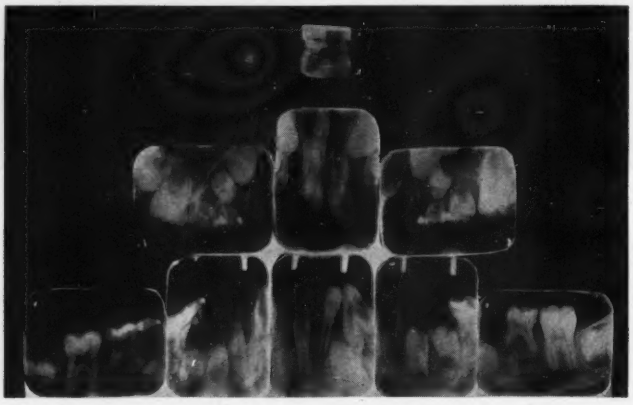

Fig. 28.

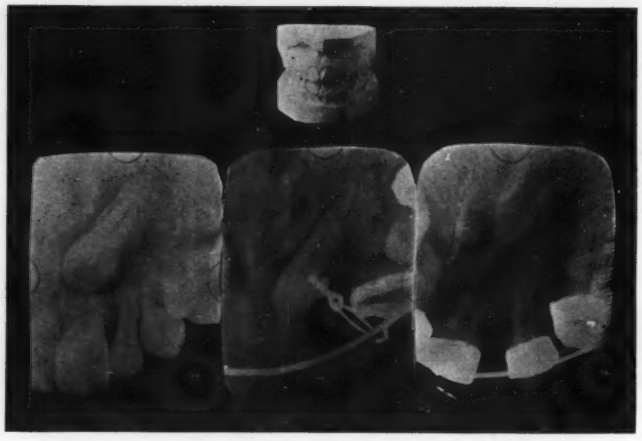

Fig. 29.

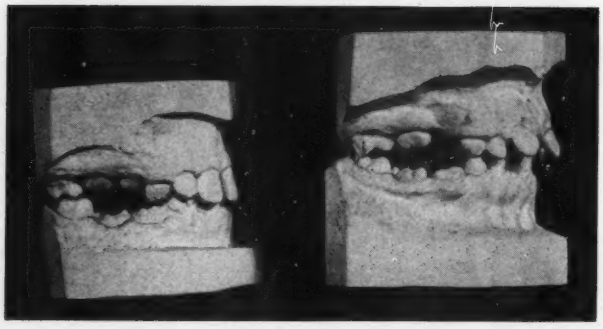

Fig. 30.

permanent teeth although some of them, particularly the maxillary teeth, were far from their normal positions.

In Fig. 20 all of the deciduous teeth were present but the permanent maxillary right lateral incisor was missing.

Fig. 21 shows a separation of the maxillary central incisors and the absence of the maxillary lateral incisors.

Fig. 22. Eight premolars were missing in this case.

Fig. 23. Note the lack of vertical development in the premolar region in this case. On the right side both second premolars were absent. On the left side both maxillary premolars were missing.

In Fig. 24 note the lack of vertical development in the premolar region in this case also. However, the films show that all of the permanent teeth are present. (The film of the mandibular right side was improperly washed, which accounts for the teeth not showing in this illustration.) The lack of vertical development therefore does not always indicate the lack of permanent teeth.

Fig. 25. In this case there was also a lack of vertical development in the premolar region. The teeth missing are maxillary lateral incisors and both mandibular right premolars. Figs. 26 and 27 show the mandible.

The radiograms in Fig. 28 show the following teeth missing: maxillary lateral incisors and second premolars, mandibular central incisors and second premolars.

Fig. 29. The maxillary right lateral incisor is absent in this case and the crown of the maxillary right canine was lying directly above and against the end of the root of the right central incisor, which was only about one-half its normal length. Whether this root had developed to its normal length and later been absorbed due to pressure I cannot say. The middle film shows the orthodontic appliance in place and the film at the right shows the present position of the canine and its relation to the other teeth. This slide shows the value of the radiogram both for diagnostic purposes and to check up on the progress of treatment.

Fig. 30 shows the casts of two brothers. The case at the left had all second premolars missing. The other case had the following teeth missing: maxillary right lateral incisor, four premolars and both second molars; mandibular four premolars and both second molars—thirteen teeth missing.

No doubt all radiographers have been impressed with the number of teeth congenitally missing and supernumerary teeth present in the cases referred to them. Perhaps the following tabulation of cases of which my records are fairly complete, will be of interest.

Right	*Maxillary*	*Left*	
16	Lateral incisor	13	
3	Canine	2	
1	First premolar	2	
14	Second premolar	15	
1	Second molar	1	Maxillary Teeth
35		33	68
Right	*Mandibular*	*Left*	
1	Central incisor	2	
1	Lateral incisor	1	
1	First premolar	0	
26	Second premolar	22	
1	Second molar	1	Mandibular Teeth
30		26	56
			124
Supernumerary teeth—all maxillary			11
Total discrepancies in 321 cases			135

Occasionally, radiograms made for assistance in diagnosing cases of malocclusion reveal the presence of cysts. I regret having none of these to show, having sent the few that I had to the oral surgeon along with the patient.

As stated earlier in the paper, I consider the use of the roentgen ray an absolute necessity in the practice of orthodontia, both as an essential aid in diagnosis and for use in noting the progress of the treatment and the development of the teeth themselves. Full mouth radiograms should be made in every case regardless of the age of the patient, and whether or not all of the permanent teeth are present in the dental arches.

THE TECHNIC OF ORAL RADIOGRAPHY

By Dr. Clarence O. Simpson, St. Louis, Mo.

PHOTOGRAPHIC PROCESSES

(Continued from page 510.)

Washing Films.—After the negatives have been fixed, it is necessary to thoroughly wash the films to remove the chemicals of the fixing solution. Although the washing is imperative for the permanency of the negatives, it is a simple process with thoroughness as the only requirement. Within reasonable bounds, the temperature of the wash water is unimportant, but it should not be warm enough to injure the emulsion. With the hardening bath previously recommended, dental films of the regular emulsion may be successfully washed at a temperature of 90 degrees and double coated films will bear a temperature of 85 degrees. This temperature possibility is stated for the benefit of those who have not been able to use running water for washing in hot weather, but water at a lower temperature is preferable when it is available.

With water entering the bottom and flowing from the top of the receptacle, films are thoroughly washed in twenty minutes, and this method should be employed where facilities permit. A special washing tank is not required, as a rubber tube from the water faucet may be inserted to the bottom of a pan or tank, and a multiple connection makes it possible to separate films in different stages of washing.

When running water is not available for washing, the films should be transferred into at least six changes of clear water, leaving them in each for five or ten minutes for a total time of forty-five minutes. After removing films from the wash water, they should be held emulsion side upward under a stream of running water to remove any foreign particles which may have adhered to the emulsion.

Reducing the Density of Negatives.—On account of the variance in thickness, in each region of an intraoral examination there is a sufficient difference in density in portions of the negatives to impair the diagnostic quality. Depending upon the general density of the negatives, portions will be either

of excessive or deficient density to clearly reveal the detail of the structures. This is especially noticeable in the radiolucence of the maxillary sinuses, and where the nose or the malar process is superimposed on the teeth. Unless

Fig. 1-*A*.

Fig. 1-*B*.

Fig. 1-*A*, 1-*B*.—A typical maxillary incisor region before and after local reduction of the negative.

Fig. 2-*A*.

Fig. 2-*B*.

Fig. 2-*A*, 2-*B*.—A typical diagonal view of the maxillary incisor region before and after local reduction of the negative.

Fig. 3-*A*.

Fig. 3-*B*.

Fig. 3-*A*, 3-*B*.—A typical maxillary canine region before and after local reduction of the negative.

supplemental exposures are made in each region to produce negatives of different density, or local reduction is employed, the maximum information will not be obtained from the examination.

The logical solution of the problem is the application of ample penetration and exposure to record the thicker portions of the region in the negative, and then reduce the density of the negative where the radiographic action has been excessive. There are characteristic areas in each region which require local reduction, while edentulous areas with the adjacent teeth included

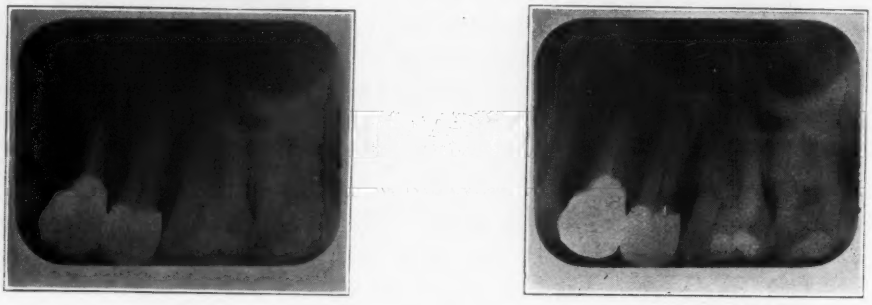

Fig. 4-*A*. Fig. 4-*B*.

Fig. 4-*A*, 4-*B*.—A typical maxillary first molar region before and after local reduction of the negative.

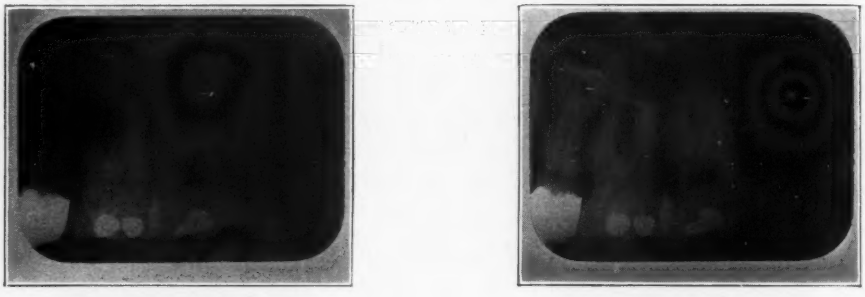

Fig. 5-*A*. Fig. 5-*B*.

Fig. 5-*A*, 5-*B*.—A typical maxillary second and third molar region before and after local reduction of the negative.

Fig. 6-*A*. Fig. 6-*B*.

Fig. 6-*A*, 6-*B*.—A typical mandibular incisor region before and after local reduction of the negative.

in the negative, and unusual formation require special reduction treatment. Equalization of density should not be attempted, but merely the reduction of the denser areas to a shade in which the structural detail is disclosed by the customary illumination. This process does not efface the radiographic evidence of pathologic conditions, but instead reveals minute structural al-

terations which otherwise would be obscured. When a cutting, rather than a proportional or flattening reducing agent is used, the contrasts of the image are accentuated which to the point of losing detail in the shadows is advantageous. After some experience, the local reduction of intraoral negatives can be quickly accomplished, and the evident improvement will compensate for the additional labor.

Reduction Technic.—After the films have been removed from the fixing solution and washed for five minutes or longer, place the receptacle convenient to a favorable illumination and seat, so the reduction may be done in comfort. White light has no objectionable effect on the action of Farmer's reducing solution, although writers who copy instead of experiment state

Fig. 7-*A*.

Fig. 7-*B*.

Fig. 7-*A*, 7-*B*.—A typical mandibular canine region before and after local reduction of the negative.

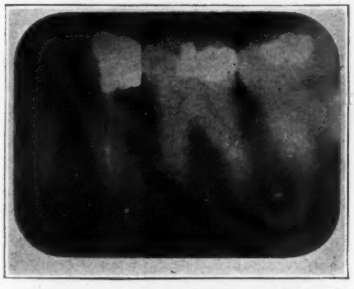

Fig. 8-*A*.

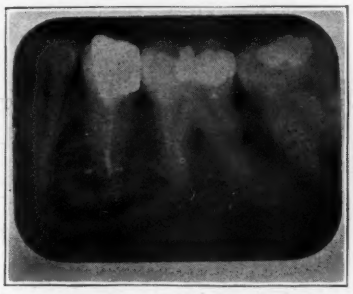

Fig. 8-*B*.

Fig. 8-*A*, 8-*B*.—A typical mandibular first molar region before and after local reduction of the negative.

that it should be used in a subdued light. The reducing solution should be mixed in a small dish, and applied with a camel's-hair brush about one-quarter of an inch in diameter or a pledget of cotton rolled on a wood applicator. If the general density of the negative should be too great, the film should be submerged in the solution for periods of one to five seconds to obtain the desired density of the shadows before the reduction of the highlights is begun. To stop the action of the reducer, dip the film in water.

For local reduction, the film, emulsion side upward, should be held so the solution will flow toward an area requiring the action instead of one which does not. This may often be regulated by curving the film to produce a con-

cavity at the desired location, by pressure of the thumb and finger on opposite edges of the film which should be the method of holding to avoid softening the emulsion. After reduction, five minutes' washing in running water is ample to remove the reducing solution, but the total washing time before and after reduction must be at least twenty minutes to remove the hypo.

FORMULA FOR REDUCING SOLUTION

STOCK SOLUTION A.	
Water	16 oz.
Sodium Cyanide	50 gr.
STOCK SOLUTION B.	
Water	1 oz.
Potassium Iodide	80 gr.
Metallic Iodine	40 gr.
REDUCING SOLUTION	
Solution A	1 oz.
Solution B	20 mm.

Fig. 9-*A*.

Fig. 9-*B*.

Fig. 9-*A*, 9-*B*.—A typical mandibular second and third molar region before and after local reduction of the negative.

Fig. 10-*A*.

Fig. 10-*B*.

Fig. 10-*A*, 10-*B*.—A maxillary first molar region in which the pathologic involvement of the bone is obscured in the negative until disclosed by local reduction.

The reducing solution should be freshly mixed for use, and as the action slows a few drops of solution B should be added. Extreme care must be exercised in handling the solution, as sodium cyanide is highly poisonous by absorption in the mouth and to a lesser degree by inhalation. The solution does not affect the skin unless there is a susceptibility to iodine, and it may be used without harm if not directly inhaled or carried to the mouth. However, caution is indicated in handling smoking articles, and washing of the hands and utensils when using the solution.

This formula is recommended instead of those generally used because of its rapid action, cutting characteristics, and negligible staining properties. The conditions under which staining has been observed were when the emulsion had dried before the hypo was completely eliminated, and after the use of a proprietary fixing solution the secret of which is more scrupulously maintained than is the excellence of the product. A small avoirdupois scale which may be purchased from a photographic supply dealer is a convenient and economic accessory to the darkroom equipment since it relieves one from dependence upon and tribute for prepared compounds.

Increasing the Density of Negatives.—Negatives lacking in density from underexposure, underdevelopment or both may be materially improved by chemical treatment. This process is not generally utilized in radiography because with most methods considerable time is required, the results are uncertain, and the tone of the negative is altered. If the error in exposure or development is discovered during the examination another exposure is preferable to intensifying the negative, but with the following formula the process is simplified and some of the objections are avoided. After the negative is fixed and washed it is placed in the intensifying solution for a few seconds to a minute depending upon the amount of intensification desired. After washing to remove the excess solution it is dipped in developer to clear and fix the image, and a few minutes' washing in running water completes the operation. A small quantity of developing solution should be used for this purpose and discarded.

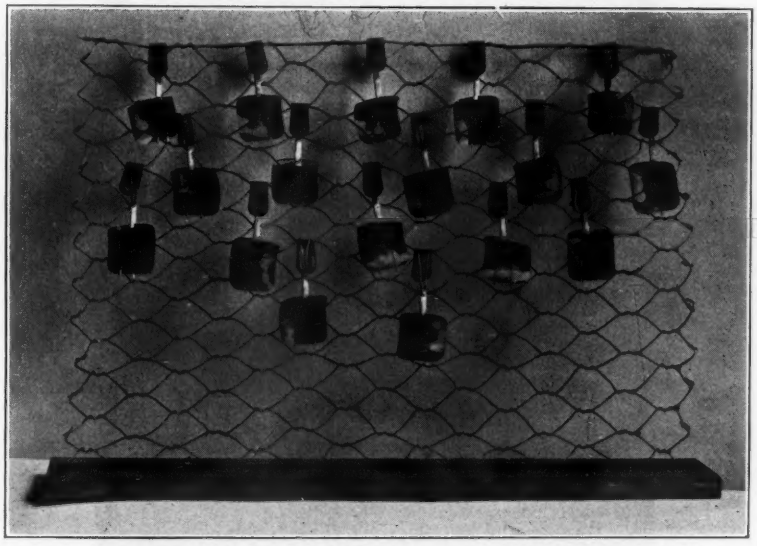

Fig. 11.—A drying rack made by attaching wire netting with staples to a wood base. With this arrangement the films of each examination can be kept separate and carried from place to place.

FORMULA FOR INTENSIFYING SOLUTION

Water	16 oz.
Potassium Iodide	80 gr.
Mercuric Iodide	80 gr.
Hypo	5 gr.

It requires about 24 hours for the mercuric iodide to dissolve, unless the bottle is placed in a hot bath and occasionally shaken.

Drying Films.—The films should be shaken to remove all the water possible and hung in a place free from dust where there is a current of air at a comfortable room temperature. The drying may be hastened by directing the air from an electric fan on the nonemulsion side of single-coated films and the edges of double-coated films, but the fan and shelf should be free from dust. Probably the ideal arrangement for drying films is a dust-proof cabinet in which is installed a dryer such as used by hairdressers to produce a current of warm air. By keeping the films of each examination separate throughout the various processes, a labeled film hook is sufficient identification for each group without mutilating the negatives by distinguishing marks.

Mounting and Filing Negatives.—Reasonable care must be given to the manipulation and disposal of negatives after drying, to keep them undam-

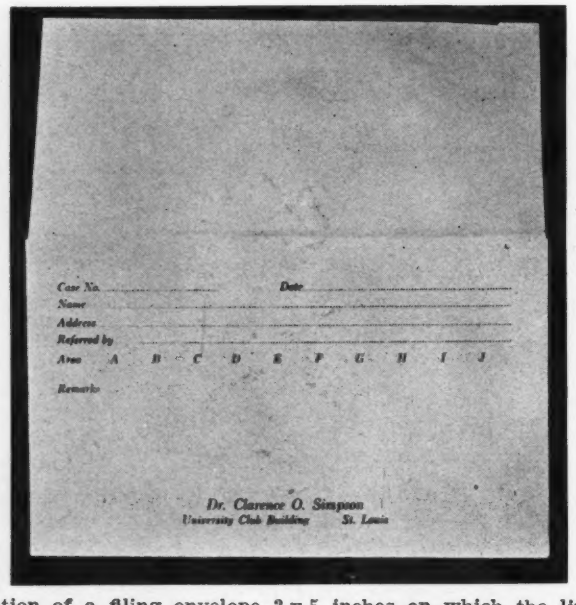

Fig. 12.—An illustration of a filing envelope 3 x 5 inches on which the line spacing conforms to that of a typewriter for convenience in typing the data.

aged and accessible. When films are removed from the drying rack they should be placed in a filing envelope on which the essential data has been written, and the envelope deposited in a temporary file until time for a final disposition. Usually one set of intraoral negatives should be mounted for convenient viewing, and the duplicates filed in an indexed cabinet. In the case of referred patients, it is customary to send the mounted negatives to the referring dentist or physician, and when a consultation is in prospect or the negatives are to be viewed for operative purposes the mounted arrangement is advantageous.

In mounting a group of intraoral films, they should be paired and laid in sequential order on a clean surface, preferably white paper. Then each pair should be viewed to select the more suitable density for uniformity, and when there are different views of a region these should be compared to decide

which may be eliminated from the mounted group. After the films to be mounted are selected, they in turn should be firmly held on a clean flat surface while the nonemulsion side is polished with a soft cloth to remove the water spots. To this stage the films should be handled by the thumb and finger on opposite edges, but in mounting them the finger covered by a soft cloth should be placed on the emulsion surface while the thumb reciprocates on the opposite side. This precaution avoids finger marks on the emulsion which mar the appearance and perhaps the utility of the negatives. The negatives should be mounted to view from the nonemulsion side, because this is the aspect of the structures recorded when the emulsion side of the film is presented toward the tube. Aerial perspective is not only evident in radiographic negatives, but is exaggerated by scattered radiation. For example, an unerupted tooth lying on the lingual side of the other teeth will register in an intraoral negative as denser and sharper in outline than the other

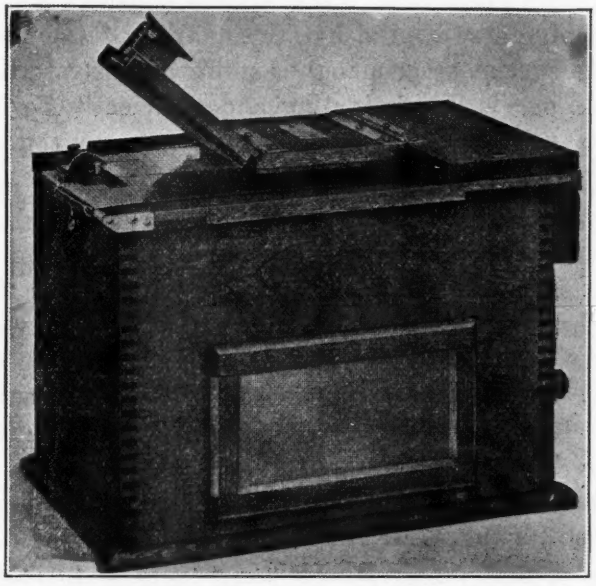

Fig. 13.—The small automatic printer for making prints and transparencies.

teeth, and appear nearer the observer than the other teeth. Therefore when the negative is viewed from the nonemulsion side with a subconscious impression of the relative location of film, teeth, and tube, the unerupted tooth correctly appears on the lingual side of the other teeth. Conversely, when the negative is viewed from the emulsion side with the idea of observing the structures from the facial aspect, the unerupted tooth still appears nearer the observer and lying on the facial side of the other teeth, which is incorrect. Even when linear perspective is recorded by stereoscopic examination, the illusion is more vivid when viewed from the nonemulsion side because of the exaggerated aerial perspective.

Mounts for intraoral negatives should be of the type having unobstructed openings for viewing. Neither a translucent base for the negative, nor a diffusing material back of the film is indicated with suitable illumination, and a translucent medium in the approximate plane of the image is distracting

to the vision. Translucent celluloid back of the film lowers the tone and obscures the detail in negatives, while the protective feature is counteracted by the abrasion of the proximating surfaces. Radiographic negatives cannot be protected from damage by people who are careless and unappreciative of them. The person who holds unprotected negatives by placing a perspiring finger on the emulsion will scratch the films by sliding them on the protective celluloid and probably extract the negatives to hold them with perspiring fingers, or break the glass if negatives are bound between glass plates. The safety match was invented to protect furniture, walls, and trousers from the type which mar radiographic negatives, and moisten the thumb with saliva to turn pages, so this sustains hope that inventive genius will devise adequate protection for unvarnished negatives.

Prints and Transparencies.—Anyone who extensively practices oral radiography will need reproductions to illustrate articles for publication, and on glass for stereopticon projection. Photographic finishers and dealers in stereopticons can supply these copies, but the quality of the product is usually mediocre and the specimens commonly exhibited illustrate little except poor craftmanship. If one is discriminating and sufficiently desirous of superior illustrations, the process can be mastered to an economic and technical advantage. A printing frame is the only additional accessory required, although a small automatic printer is more convenient.

For prints on paper the negatives are placed emulsion side upward on the glass of the printing frame, the paper placed emulsion side down on the negatives, and the exposure made. A few test exposures will enable one to closely calculate the exposure for negatives of different density and different grades of paper. With a supply of paper for various degrees of contrast, the results can be effectively controlled. The greatest detail is obtained with glossy paper, and by drying the prints on a ferrotype plate. Extraoral negatives and mounted groups are copied by photographing to a reduced size and printing from the photographic negative.

Stereopticon reproductions are made on lantern slide plates which may be purchased from dealers in photographic supplies. The printing process is the same as for paper except the exposure is greatly reduced. If a 25 watt lamp is used for printing, the printing frame should be placed about three feet away so the exposure can be accurately timed and corrected. The exposure should be limited to a degree which will permit sufficient development to produce a dense black mat around the negatives. After the lantern slide plates have dried a cover glass is bound on the emulsion side with binding strips made for this purpose. A marker on the lower left corner of the cover glass directs the placement of the slide in the lantern. The cover glass may be obtained by removing the emulsion from unsatisfactory plates. If reproductions are desired as negatives instead of positives, a print may be made on commercial film and this image transferred to the paper or transparency.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Alveolar Curettage. A. Herpin (Paris). La Revue de Stomatologie, July, 1924, xxvi, 7.

Most extractions come about because of inflammatory affections of the teeth which are apt to involve the peridental tissues. Reparation is at times unfavorably influenced, as are also the subsequent interventions of prosthesis. That is to say, the healing of the cavity is delayed by the alveolar lesions. It is, of course, natural that we should seek to accelerate in some manner the almost interminably slow cicatrization met with in some cases, but it is possible to overdo and defeat the object of the intervention. The author saw two cases at about the same period which illustrate the subject. In one case in which he had advised against immediate extraction the dentist consulted later had opened the dental canal by the curette after extraction. The patient had then come to the author to have the damage made good. Although a considerable interval has now elapsed the defect is not entirely healed. In the second case the patient also claimed that his extraction cavity would not heal. His physician had regarded his condition as belonging to the facial surgeon and one of the latter had done a radical operation, removing a sound tooth which was in his way and curetting so extensively that a very large cavity remained to heal.

Despite these two cases the author would not indiscriminately condemn alveolar curettage. The practice has come into use with x-ray diagnosis and the tissues thus shown to be pathologic are regarded as better extirpated than left behind. But the surgeon and operating dentist may go too far, be too zealous. When cavities result from these interventions which are too large to undergo repair, it is evident that something is wrong.

Oral Sepsis as a Predisposing Cause of Cancer. F. St. J. Steadman (London). The Journal of Cancer, April, 1924, i, 2.

Dr. Steadman's views on this subject have received considerable prominence although it has been alleged that he has not proved his contention. He has sought to show by statistics a parallelism between the incidence of cancer and the incidence of pyorrhea and other buccal affections. Naturally

if it once be admitted that some degree of pyorrhea is all but universal all conclusions based on statistics will be open to suspicion. While cancer within the mouth receives the most notice cancer in other localities is also considered as far as it affects the alimentary canal and larynx. Cancer in other localities, as breast and uterus, is not mentioned although there seems to be no reason why cancer here should not be brought in relationship to oral sepsis in statistics, even if only for purpose of control. It is not easy to comprehend why the author gives figures for cancer of the rectum, merely because it is part of the alimentary canal and ignores the incidence of malignancy in other important localities. In asking how oral sepsis might be a factor in the production of cancer of the rectum he discusses the possibility of direct transport of hypothetical germs from the mouth, but he also considers the possibility of infection via the blood stream, lowering of the general resistance as a result of toxemia of buccal origin and even extension of a gastritis downward to the colon—although he admits that this is purely speculative. The author's theories appear to rest largely on the belief that cancer is a disease of germ causation. He attaches great significance to the swallowing of pus by pyorrheic patients and to the claim that swallowed pus is one of the commoner causes of gastritis, a condition assumed to be a forerunner of cancer of the stomach. From another angle he states that the incidence of chronic sepsis (meaning the mild or medical form) increases steadily with age, and hence is to be attributed largely to dental infection. The incidence of cancer also increases with age. Therefore, cancer, of the alimentary canal, at least, is very largely the result of oral sepsis. No doubt the same arguments would hold good for intestinal autointoxication as a cause of cancer.

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EDITORIALS

The Status of Orthodontia in Europe

IT is now well over twenty years since throughout many parts of the United States, members of the dental profession gave up general practice and devoted themselves to the practice of orthodontics exclusively. With very few, if any, exceptions these men have been successful not only in their own eyes, but in the eyes of the dental and medical professions and the general public.

The wonderful work done by these pioneers so redounded to the credit of the specialty that within the past decade the demands for orthodontists in all of the urban settlements in America has been greater than the supply. We believe that this has been due to the fact that the specialty cut itself away from general practice and the members thereof, adhering strictly and

exclusively to orthodontia. We believe also that the wonderful condition of the specialty of orthodontia in the United States has been materially aided by the influence of the American Society of Orthodontists; a body of exclusive specialists and in later years the establishment of a journal devoted to orthodontia. In other words, in the profession of dentistry the specialty of orthodontia stands out as the first distinct specialty with its own national society and own organ of publication.

In sharp contrast to the position and condition of the specialty of orthodontics in this country is the condition and position of that specialty in Europe. In the whole of Europe (if we are to take a recent Orthodontic Directory which has been compiled with great care as any indication) there are not over ten practicing orthodontics exclusively. Therefore, there is as yet, no society in Europe or in any of the individual countries of Europe, which is composed of orthodontists practicing the specialty exclusively. At the present date such a society is an impossibility.

As to why there are not more men practicing the specialty exclusively, particularly in the large cities of Europe, one should be brave if he dared an answer. From what we have been able to learn from orthodontists who visit Europe and attend the meetings of one or more of the dental societies, it would appear that there is as yet a lack of interest among the men capable of practicing orthodontia. We have heard some of the leading members of the dental profession in Europe (and unfortunately many of them are graduates of American institutions) say, "But I am busy. Why should I attempt orthodontics when I can make more money and care for more people in general practice?" We have heard this not from one, but from several. That, of course, is the individual opinion, but we have wondered why more men have not been stimulated by the wonderful good they can do the rising generations, in the practice of orthodontics, to forego a little of their wealth and devote more time to this work which can be of such great benefit, particularly to growing children. It must be stated to the great credit of those men who have specialized in orthodontics in Europe, that while probably they have not been as conspicuous money-makers as their confreres in general practice, nevertheless, they have done wonderful work and they have been able also to live. Yet this very question of economics has forced many men in Europe who would devote much time to orthodontics, to combine it with general practice; and we in America know that the specialty of orthodontia could never have made the wonderful leaders and teachers whose names today are almost legion in our specialty here, had these men attempted to combine the practice of orthodontia with their general practice.

Now as to the question of orthodontic societies in Europe; naturally it must follow when the above individual conditions are appreciated, that it would be impossible to have societies made up of exclusive orthodontists; for when one considers that such cities as Paris and London, among the very largest in the world, can only boast of one or two exclusive practitioners, a society of exclusive practitioners is out of the question; but the interest in orthodontics (and we believe that America is almost wholly responsible for

having stimulated that great interest in Europe) has been so keen during the past decade, that orthodontic societies of a unique character have been organized in the several countries and a sort of meeting ground or parent body as we might call it, was organized many years ago as the "European Orthodontological Society." In such countries as England, France and Germany there are thriving societies for the study of orthodontics. Membership in each is open to all ethical and legal practitioners of dentistry in their respective countries; but we will also find in these societies, serving not only as officers, but as teachers and councilors a body of men eager for more knowledge in this wonderful specialty. It would be well to point out at this time that the British have so named their society that no misinterpretation can possibly be applied to it. It is known as the "British Society for the *Study* of Orthodontics."

It may not be a difficult financial problem for these national orthodontic societies to function, because it is all within the boundaries of one nation, yet we must appreciate that the currencies, finances and economics of the several nations of Europe have undergone, and are still undergoing, a most disastrous revolution, not evolution, so that with the European Orthodontolgical Society, as with any international society, we have unfortunate conditions and complications. At the recent meeting of the European Orthodontological Society held in Amsterdam, in a country whose currency is nearly on a par with the American, a country in which the American dollar goes no further than it does in America, it was noticed that there were present but one or two from Germany, but two from France, none from Luxemburg and one from Belgium. When one inquired the reason, the answer given was to the effect, "How can a man earn francs or marks and spend dollars?" A franc is five cents when he steps across the borders of France or Belgium, while within the borders of France or Belgium, it still has much of the purchasing power of the old pre-war franc. Furthermore, since the war it has been difficult for these men to even earn the comparative increase to make up for the depletion of currency in their own borders. Now comes one of the problems of the international professional bodies, namely, the collection of dues of members of countries whose currencies are depleted to a cruel point in the matter of international exchange. The dues in the European Orthodontological Society are approximately two pounds or nine dollars. With the franc at one quarter of its pre-war value, when used in international exchange, the Frenchman must pay practically twenty-eight dollars for his dues, while in his home society he pays but a slight advance over what he did during pre-war days. This naturally applies to a greater or less degree in all the other countries.

At the meeting in Kansas City last March there was launched most successfully a movement for an International Orthodontic Congress which will be held in 1926 and plans were outlined roughly which carried with them a certain financial scheme. To those of us in America it appeared simple and easy of compliance, but when we had these financial situations of Europe laid before us and their effect in international scientific bodies, we saw imme-

diately that these different orthodontic societies that are craving for all the knowledge they can get in the specialty, could not possibly enter the Congress under those conditions. At the meeting of the American Society in March, the president elect volunteered to go to Europe and present invitations to these societies to become component parts of the Congress, and we are informed that after a conference with the officers of the French and British societies and the European Orthodontological Society, he was compelled to admit that the financial plan as presented at Kansas City could never be met by the European societies, but fortunately a solution of the matter was found at that conference, whereby these societies would be permitted to become component parts of the Congress without embarrassment.

The great question now is, "What is the responsibility of the American Orthodontist to his European confreres today?" In dealing with this problem we will speak of the European Orthodontological Society as a parent body in Europe, the same as we speak of the American society as the parent orthodontic body in the United States. While the European society has many general practitioners among its members, it also numbers practically all of the leading specialists in Europe together with those men in general practice who have devoted so much time to the practice and teaching of orthodontics, that they are recognized as specialists in this work, not only in their own community and their country, but some of them internationally. During the past few years the American orthodontist has contributed every year to the program of the European Orthodontological Society. Some years he has contributed the major part of the program; other years a distinctly minor part. At all times has the American orthodontist received, not only the greatest courtesy, but he has been honored with the keenest attention and interest whenever he appeared on the program of the European Orthodontological Society and must always have felt that he was well paid for his efforts. He was sure to be invited to become a member of the society and the mere accepting of membership in the European Society of Orthodontists has proved within the past two years to have been the very thing that has held up the hands of those men who have been fighting for orthodontics in Europe.

We now come to a subject which we wish we did not have to present, but the orthodontists of America must know. There has been an attempt for the past two years to force the European Orthodontological Society out of existence and the methods employed have not been of too high ethical a character. The final blow was supposed to have been struck at Amsterdam in August when we were informed that a number of the members of the European Orthodontological Society (about ten) sent in their resignations. Every one of these men were Americans or graduates of American institutions, and, of course, we believe that the European Orthodontological Society is stronger scientifically, educationally and socially without these men; but unfortunately the treasurer felt the loss of these ten men at ten dollars per member very much because, as we have pointed out, early in this editorial, the question of financing scientific bodies in Europe is a very serious one.

There were present at this meeting in Amsterdam fortunately, we believe, several orthodontists from America, who sensing the situation to a certain extent, stepped into the breach and pledged to the officers and members there present the support of all of the fair and high-minded men in the American societies of orthodontia. For every member who resigned at this meeting there was procured a member from among the orthodontists of America.

One of the methods to put this society of orthodontia out of existence, (which society has been in existence since 1907, and numbers among its founders such men as A. F. Lundstrom, Josef Grunberg, M. Pfluger, Kirk Davenport and the late William G. Law) was made to force it to become a Section in Orthodontia in the American Dental Society of Europe. First of all this would be impossible because membership in the American Dental Society of Europe is confined exclusively to graduates of American dental institutions; and the European Orthodontological Society numbers among its members graduates of the leading institutions of all of the countries of Europe, and in a moment these men would have been deprived of their affiliations. Secondly, we believe that this would have been the most disastrous blow that orthodontia could have received in Europe, for who is there who would dare to stand up and state that orthodontia in America could have arrived at the position it holds today, had it been nothing but a section of the American Dental Association; and we know, and every member of the dental profession who gives any thought to this subject whatever will agree, that it was the fact that we had a national body of orthodontists, made up of men practicing it exclusively, working together for the common interest of the specialty, that has brought the specialty to the high, dignified, and useful position it holds in the world today; and although the European society is not, and cannot for the present be, made up of members practicing the specialty exclusively, it stands in the same relation and position to orthodontia in Europe as did and does the American Society of Orthodontists stand in America. It is for this reason that we bespeak the whole-hearted, unqualified, moral and personal support of every orthodontist in America for our European confreres. Whenever you find that you are fortunate enough to make a trip to Europe at a time when this society will hold its meeting, advise the officers of the society and take with you to that meeting a contribution in the form of a paper, clinic or appliance, for no matter how small you may think it, remember it will be an added stimulus to those men who are working out the serious problem of the life of an orthodontic society in Europe.

Notes on Dental Surgery and Pathology*

AS is claimed by the author on the title page, the book is intended as a reference work for the busy practitioner and a notebook for the student. It is complete in that it is, in an abbreviated form, an outline of most of the different phases of dentistry, including the care of deciduous teeth, several rather exhaustive discussions of caries, a review of the various methods of root canal treatment and filling; an instructive chapter on fracture of the jaws, description of the various pathologic conditions existing around the mouth and jaws and their treatments.

The author quotes freely the writings of his contemporaries and refers quite often to technics and theories advanced by other men, with his opinion which helps to make the subject quite clear.

Although in our opinion there is too much emphasis placed upon heredity as a cause of malocclusion wherein is given the classical example of the "underhung jaw" of the Hapsburgs, and also upon the theory of cross-breeding as a cause of malocclusion, i.e., dolichocephalics—having large teeth, with brachycephalics—having small mouth; being unable to justify these theories with embryologic facts, we nevertheless are heartily in accordance with him in his treatments of children's teeth and consider that chapter an important complement to the work.

The book continues in an orderly, logical manner with the description of the progressive pathologic changes of the pulp-pericemental membrane, gums and mucous membranes, and jaws with a comprehensive and thorough treatment in each case. In the treatment of fractures of the jaw, there is a very instructive table of classification and a summary of various methods of treatment together with a description of a great many splints that are applicable, their advantages and disadvantages.

Of the supplementary chapters, those on the "Difficulties, Sequelae, etc., of Tooth Extraction," and particularly that on Hemorrhage after Tooth Extraction, Its Varieties and Treatment, help to make the book a valuable one and truly serve the purpose intended.

We like to commend the author also on his consistency in his use of scientific terminology throughout the work adhering to those terms scientifically correct which in our opinion is a very important feature in a book that "is intended as a reference book for busy practitioners and a notebook for students."

—*H. I. M.*

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*Notes on Dental Surgery and Pathology. By T. W. Widdowson, Toronto, Canada. Second Edition. Published by Wm. Wood and Co., New York.

ORTHODONTIC NEWS AND NOTES

American Dental Association—Sixty-Sixth Annual Session, Dallas, Texas November 10, 11, 12, 13, and 14, 1924

OFFICIAL CALL

To the Officers, Members, and Constituent Societies of the American Dental Association

You are hereby notified that the Sixty-Sixth Annual Session of the American Dental Association will be held at Dallas, Texas, on November 10, 11, 12, 13, and 14, 1924.

The House of Delegates will convene at 10:00 o'clock in the forenoon and 2:30 o'clock in the afternoon, Monday, November 10th, 1924, in the Assembly Room of the Art Gallery, Dallas, Texas. All subsequent meetings of the House of Delegates will be held in the same place.

The general meeting, which constitutes the opening exercises of the session, will be held on Tuesday, November 11, 1924, at 10:30 A.M. in the Convention and Exhibit Hall, Dallas, Texas, and general meetings will be held at 8:00 P.M. on that and subsequent days of the session.

The various sections of the American Dental Association will meet Tuesday, November 11, 1924, at 2:00 o'clock P.M. and thereafter according to their respective programs.

The Registration Department will be open from 8:30 o'clock A.M. until 5:00 o'clock P.M. on Monday, Tuesday, Wednesday, and Thursday, November 10, 11, 12, and 13, and from 8:30 A.M. to 10:00 A.M. on Friday, November 14, at the entrance of the Convention and Exhibit Hall, Dallas, Texas.

The constituent societies are hereby notified to file with the General Secretary of this Association, at least thirty (30) days prior to the first day of said Annual Session, a list of names and addresses of their delegates and alternates.

Wm. A. Giffen, President.
Otto U. King, Secretary.

Admission to Dallas Meeting

September 5, 1924.

Dear Doctor:

The House of Delegates at the 1923 meeting at Cleveland passed by unanimous vote an amendment which now makes it impossible for the General Secretary to accept applications for membership at the annual sessions. There-

fore, no dentist living in the United States will be permitted to attend the meeting in Dallas unless he is an active member or presents satisfactory credentials from his state society.

I trust that you will magnify this new law of our Association so that no dentist from your state who is not a member of your society will go to Dallas with the expectation of securing admission to the meeting.

Active members should bring their membership cards, thus avoiding misunderstanding and delay at the registration window.

Looking forward to the pleasure of meeting you at the great Dallas meeting, with best wishes, I am,

Fraternally yours,
Otto U. King, Secretary.

Preliminary Program for Dallas Session

First General Session (General Assembly Hall, Convention and Exhibit Building)

Tuesday Morning, November 11
9:40 o'clock

Recital 9:40-10:00
By Orchestra Dallas County Dental Society

Invocation
By Bishop Harry T. Moore of the Episcopal Church, Dallas, Texas

Vocal Selection
By Mrs. Albert T. Smith...Dallas, Texas

Address of Welcome on Behalf of the State of Texas
By Governor Pat M. Neff

Address of Welcome on Behalf of the City of Dallas
By Mayor L. Blaylock

Address of Welcome on Behalf of the Dallas Chamber of Commerce
By T. M. McCullum, President

Address of Welcome on Behalf of Baylor University
By S. P. Brooks, President

Address of Welcome on Behalf of the Texas State Dental Society
By W. O. Talbot, President

Address of Welcome on Behalf of the Dental Profession of Dallas and Presentation of Gavel to President Giffen on Behalf of the Local Committee on Arrangements
By Dr. Bush Jones

Response to Addresses of Welcome
By J. F. Biddle.....Pittsburgh, Pa.

Introduction of Distinguished Visitors

President's Address
By William A. Giffen....Detroit, Mich.

Exit March

Orthodontia and Periodontia

(Section Hall No. 1, Convention and Exhibit Building. All subsequent meetings held in the same place.)

OFFICERS OF SECTION

William C. Fisher, Chairman..New York City
Olim Kirkland, Vice-Chairman .....
.....Montgomery, Ala.
B. Frank Gray, Secretary .....
.....San Francisco, Calif.

Tuesday Afternoon, November 11
2 to 5 o'clock

Address by Chairman of the Section
By W. C. Fisher .....New York City

"The Question of Speed in Orthodontic Treatment"
By James D. McCoy..Los Angeles, Calif.

Synopsis—The length of time that should be required for the correction of commonly occurring types of malocclusion is, at present, a subject of debate among orthodontists. Any satisfactory solution of the problem must be settled on a correct conception of what is entailed in treatment and what must be accomplished by it. The mere mechanical movement of teeth into correct occlusal relations is but one step toward the goal of success, for other factors of equal importance must be considered. Controversies emanating from the exponents of various types of orthodontic appliances have done much to becloud the real issues at stake and have created false and harmful impressions, derogatory to the progress of orthodontia.

"A Consideration of the Correct Time for Orthodontic Treatment"
By Charles R. Baker.....Evanston, Ill.

Synopsis—Patients should receive early orthodontic treatment, with the idea of assisting the teeth and all correlated tissues to develop to the normal and afford the maximum functional efficiency for the individual. Naturally, there are exceptions to this rule, which will also be discussed.

Wednesday Morning, November 12
9 to 12 o'clock

"The Orthodontic Sphere"

By Oscar E. Busby.....Dallas, Texas

Synopsis—The correction of malocclusion of the teeth is merely an incident in the orthodontic sphere. The teeth serve as points of anchorage in directing the growth and development of the entire organism; especially those structures composing the head and face; therefore, there will be discussed some of the biologic subjects relating to growth and development, taking into consideration some of the histologic elements, anatomic structures and morphologic changes during orthodontic procedure.

"Reasons for the Existence of an Orthodontic Specialty"

By T. G. Duckworth, San Antonio, Texas

"Orthodontic Treatment as Related to the Growth of the Face"

By W. E. Flesher..Oklahoma City, Okla.

Synopsis—The normal changes in the facial lines during growth from infancy to adult life. The facial lines as influenced by the malposition of the teeth. Growth of the face toward the normal in normal occlusion. Progressive growth toward the abnormal in malocclusion. Lack of evidence of incipient stages of malocclusion in the face. The necessity of early recognition and treatment of malocclusion to avoid facial deformities. Lack of assurance that treatment, when delayed, will restore the facial lines to normal, one of the ends sought in orthodontic treatment.

Wednesday Afternoon, November 12
2 to 5 o'clock

"The Application of Biologic Principles to the Practice of Periodontia"

By Benjamin Tishler....Boston, Mass.

Synopsis—We should no longer ignore the biologic factors that control the metabolism of bodily tissues, and we should use the cell as a basis in the practice of our profession, rather than the tissues, as we have in the past. Some practical facts will be correlated, with this idea in view, in order to emphasize its importance.

"The Sequelae of Traumatic Occlusion"

By W. H. Scherer.....Houston, Texas

Synopsis—Trauma is an injury to a tissue produced by mechanical injurious agents. Traumatic occlusion will cause a condensing osteitis or a breaking down of the supporting tissues in frail alveolar structures. Numerous manifestations of traumatic occlusion are found, pulpitis, recession of the marginal gingiva and tenderness of the gingival tissue. The prevalence of occlusal trauma is greater than is usually supposed. It is not limited to its association with periodontoclasia, as it may exist for some time before it is apparent.

"Eradication of Pyorrhea Pockets and Postoperative Packing"

By A. W. Ward....San Francisco, Calif.

Thursday Morning, November 13
9 to 12 o'clock

"Diet and Its Relation to Periodontal Disturbances"

By E. A. Hennen.....Wheeling, W. Va.

"Trophic Changes in the Osseous Structures of the Palate and the Alveolar Process in Tuberculosis"

By C. S. Krame.....Woodman, Colo.

Synopsis—Brief history of tuberculosis; pulmonary tuberculosis, the most common form of the disease in man. Tubercle baccilli from sputum from the mouth and lungs; culture, tuberculosis in soft tissues, lungs and larynx; ulcers of gums and tongue, cervical and submental glands; hypertrophic osteoarthropathy of fingers, toes, gums, hard palate and alveolar processes. (Slides.) Percentage of this condition and type of cases in which it occurs.

St. Louis Dental Society

The St. Louis Dental Society Library will be dedicated at the Chase Hotel on October 18th. At least a portion of the lectures will be broadcasted over the radio.

Dr. Arthur D. Black of Chicago and Dr. Arthur E. Bostwick, Librarian of the St. Louis Public Library, will speak on this occasion.

The service of the St. Louis Dental Society Library will be administered by the Public Library of St. Louis which will be a new departure in Library Service to a profession. It will have all the advantages of any library without the responsibilities.—E. E. Haverstick, *President*.

American Society of Orthodontists

The Twenty-fourth Annual Meeting of the American Society of Orthodontists will be held in the new Atlanta-Biltmore Hotel, at Atlanta, Ga., April 14, 15, 16 and 17, 1925. (Mark off the date now.)

Walter H. Ellis, Sec'y-Treas.,
397 Delaware Avenue,
Buffalo, N. Y.

Clinton C. Howard, President,
Doctors Building,
Atlanta, Ga.

New York Society of Orthodontists

The fall meeting of the New York Society of Orthodontists will be held the afternoon and evening of Wednesday, October 8, 1924, at the Hotel Vanderbilt, Park Avenue, New York City.—William C. Fisher, Sec'y.

The American Society of Dental Radiographers

The annual meeting of the American Society of Dental Radiographers will be held at the Adolphus Hotel, Dallas, Texas, Friday and Saturday, November 7 and 8. All dentists interested in radiography are invited to attend.

Arnott A. Moore, President
131 Allen Avenue
Buffalo, N. Y.

Martin Dewey, Secretary
501 Fifth Ave.
New York, N. Y.

Notes of Interest

Dr. George F. Burke and Earl H. Teetzel announce their association September 1, 1924, in the practice of orthodontia exclusively, David Whitney Building, Detroit, Michigan.

Dr. Forte K. Rabb wishes to announce the opening of his office at 808-9 Lamar Bldg., Augusta, Ga. Practice limited to orthodontia.

Dr. L. W. Gange announces the opening of his office in the Appel Bldg., Aberdeen, S. D., for the exclusive practice of orthodontia.